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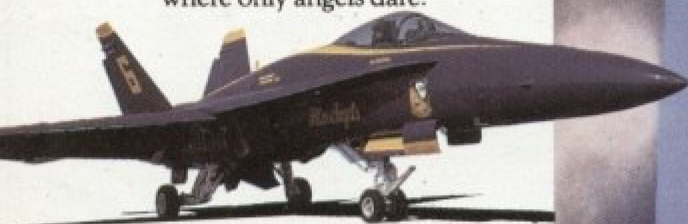
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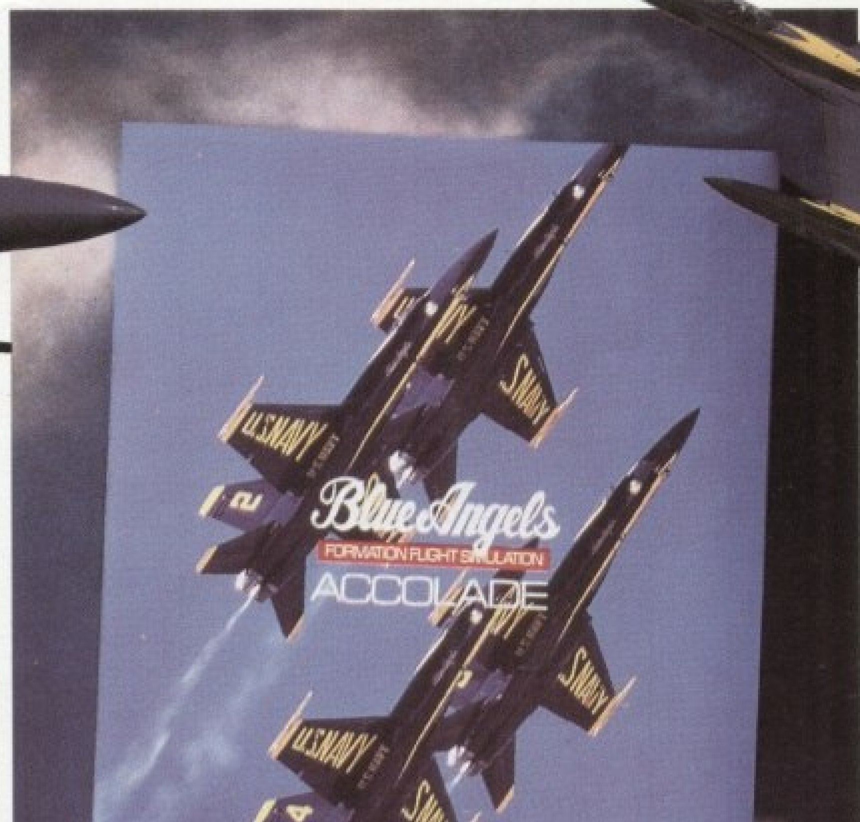
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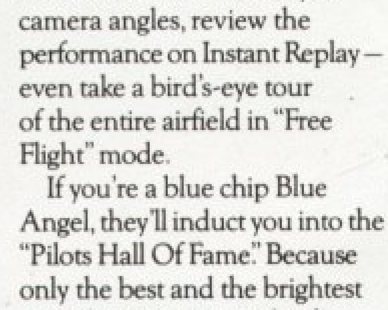
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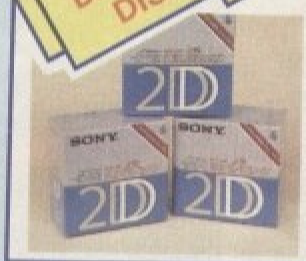
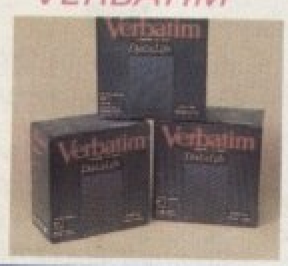
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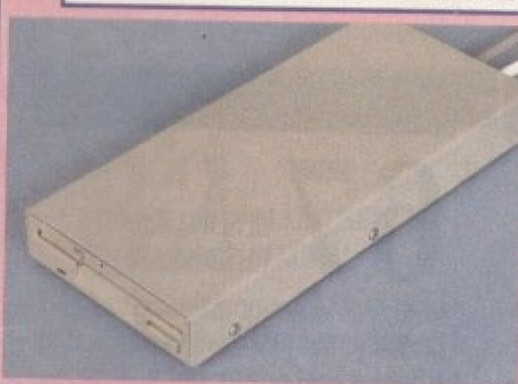
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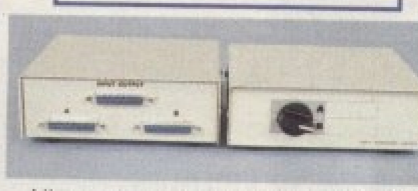
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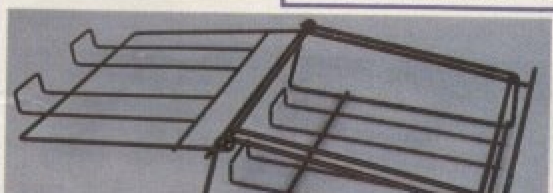
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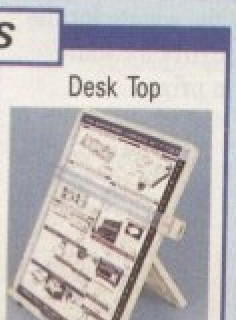
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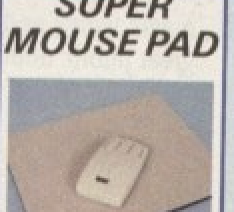
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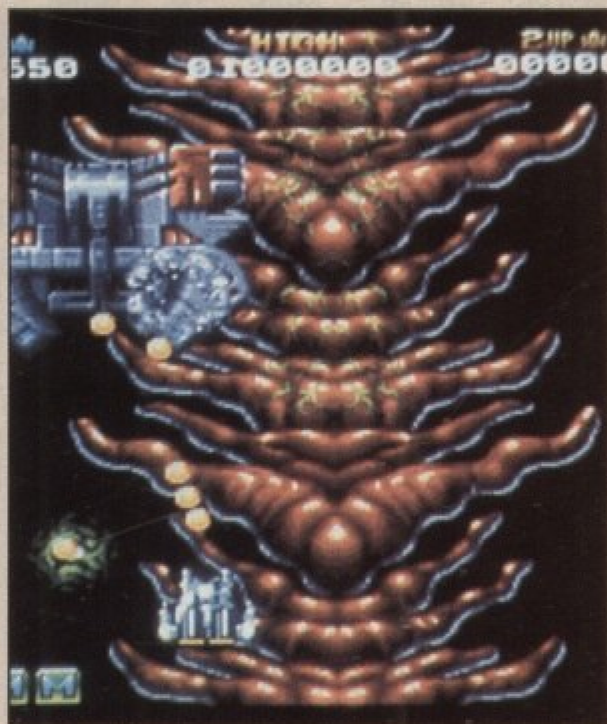
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Amiga CD system shown in secret

FAVOURED developers in California are reported to have been shown a new Amiga 500 based system for launch in the summer. Based on an enhanced Amiga 500, it includes a CD rom player and is targeted at the rapidly growing home entertainment market.

The unit is designed to sit with a hi-fi, satellite dish decoder, cable system, video recorder and TV in the user's lounge. It will play normal audio CDs through the hi-fi but can also be used as a games machine with the addition of a remote keyboard and mouse which use an infra red link.

The CD player can be used to store up to 600 megabytes of data – which gives scope for some awesome graphics.

Compact disc manufacture is now pretty cheap, there is no reason why a two floppy disc game couldn't be produced as cheaply for this system as a single CD program.

The target price is $600, which works out to be around £430 with Vat.

A separate box which allows existing Amiga users to add a CD Rom will also be launched, although there are no details as to when or how much it will cost.

EA wins for charity

ELECTRONIC ARTS is the first winner of the new Commodore award for Enterprise and Vision. The EnVi award was won by Deluxe Paint III, which the judges felt was the program which best utilised the Amiga's features.

Mark Lewis, the Managing Director of Electronic Arts and general good egg, said: "We are very proud that Deluxe Paint III has been chosen to be the first recipient of this award. The Amiga is a great machine which Electronic Arts has supported from the beginning".

Along with the award goes a prize of £2,000, half of which goes to a nominated charity, the other half to the software company. Commodore and Electronic Arts decided that the full amount should be given to the Royal Variety Club charity.

The runners up were Music-X, The Works (Platinum Edition), Sculpt Animate 4D and Shadow of the Beast.

For more details on Deluxe Paint III, including information on how to upgrade from Deluxe Paint II for £30, contact Electronic Arts on 0753 49442.



Mark Lewis with the Commodore award

Commodore looks at Konix

UNCONFIRMED rumours report that a high level team from Commodore US is investigating the possibilty of buying the rights to the Konix Multi-system.

If true, it could mean that we will see the revolutionary games machine with a chicken-head logo. Such a deal would also be likely to mean a long delay before the Konix hits the streets.

When Commodore has bought the rights to technology in the past it has spent a long time refining, developing and production engineering the hardware.

The Hyperion PC technology took several years to emerge as a Commodore machine. The Amiga also benefited from many changes between the sale of the company and launch of the machine.

There are loads of parallels between the Multi-system and the Amiga, which would make it a neat fit in the history of computing.

Lost contact

Would the programmer who told Jeff Walker about his C interpreter please get back in touch ASAP. Thanks.

Incentive magic for satellite

BRITISH Satellite Broadcasting will use Amigas to show a programme which befits the medium. The Satellite Game uses technology first developed for the ITV dungeon programme Knight-mare, but with an extra twist.

Incentive Software has customised its Freescape graphics system for the programme. Using an Amiga 2000 with a 68020 processor card and what might well be the world's longest joystick lead courtesy of Euromax.

Two levels of Amiga graphics are used. The first stores high resolution frame rendered images on video tape.

The second uses Freescape for interactive graphics as contestants control a robot which wanders around satellite in the game.

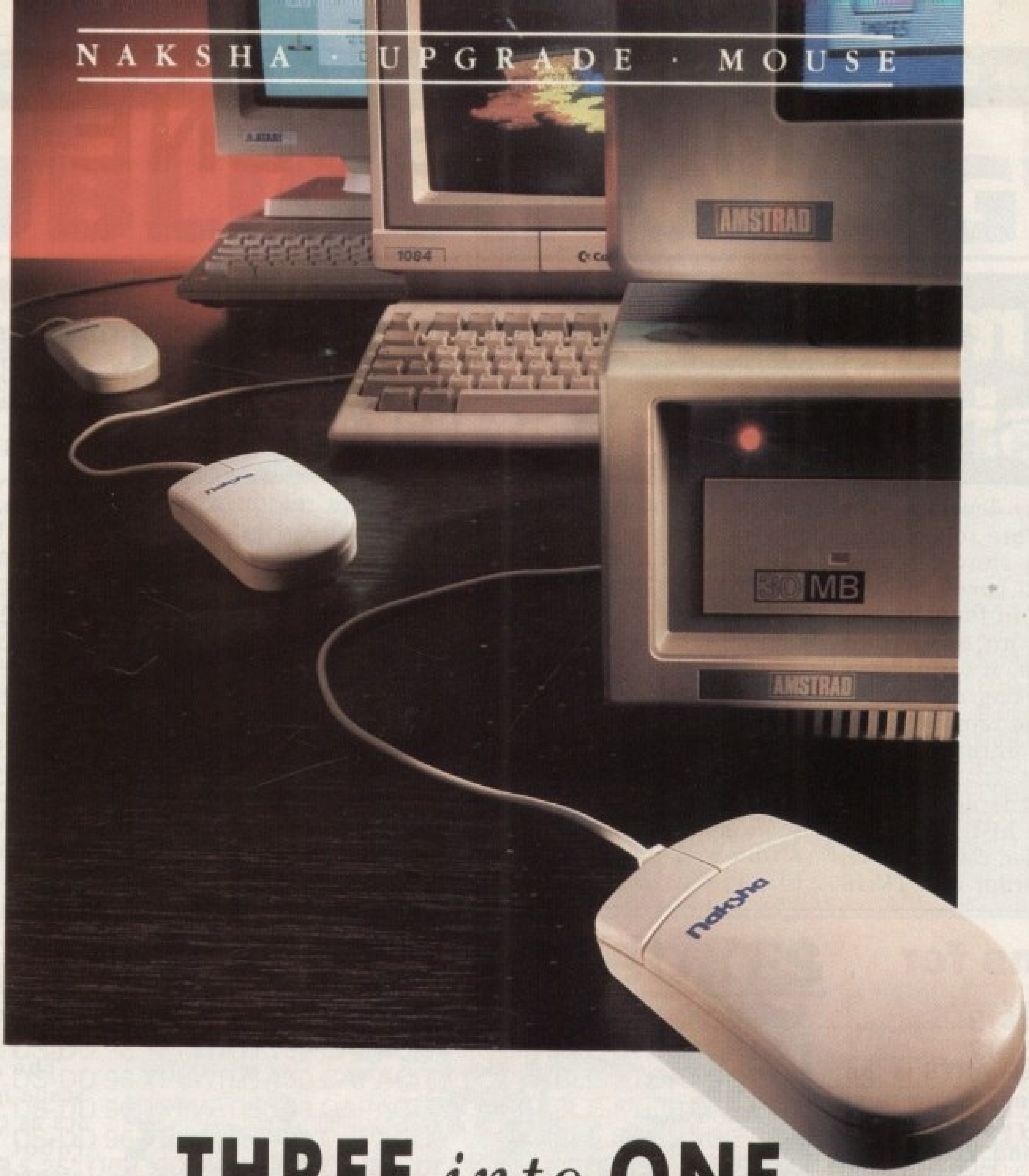
The Enigma Satellite is the key to saving mankind, put into orbit by some aliens, it contains a time bomb. Sounds exciting enough to be worth buying a squarial for.

A word from your micro

IT may not tell you to fasten your seat belt but your Amiga could soon be voicing other commands thanks to David Sands, the man responsible for the first talking dashboard.

From his company Sands Technology (0223 420288) has come Speakeasy II, a phonetic speech synthesiser which makes it easy and cost effective to add synthetic speech to computers.

It produces clear and natural speech by programming a model of the human vocal tract. As a complete boxed unit it costs £402. As a board needing 12 volt supply and a loudspeaker it costs £310.



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It's the Amiga 200,000

WHEN production engineer Dean Dibsdall went to Harpers Computers in Woking to buy an Amiga 500 he had a surprise in store. As the 200,000th person to buy a 500, he was greeted by Commodore's regional sales manager Martyn Chipperfield who presented him with a Class of the '90s software bundle.

Dean's prize includes Deluxe Paint II, Superbase Personal, Publisher's Choice, Maxiplan 500, Dr T's Midi Rocording Studio and Midi interface, Amiga Logo, BBC emulator and BBC programs, a box of 10 blank discs, a mouse mat and a disc wallet.

Commodore claims that more than two million Amiga 500s are now in use worldwide.



Dean Dibsdall and his wife Olivia receive their software\surprise bundle from Commodore regional sales manager Martyn Chipperfield

Portable Amiga soon

GIGATRON, the German manufacturer of Amiga expansions, is to launch a portable Amiga at the Hanover Fair. This uses a redesigned motherboard and either a gas plasma or 16 grey scale LCD display. The gas plasma unit costs £2,500 and the LCD version £1,700.

Options include up to 2 meg ram on the mother unit and one of the new generation of 23ms 2.5in hard discs with 20, 40 or 100 meg capacity. All machines have slots for standard Amiga 2000 peripherals.

Commodore has not been involved with the development of the system, but is aware of the unit. The machine is expected to go on sale sometime between April and July.

Gigatron has a number of other new products in the wings, including an Amiga with a 68020 on the motherboard which expands the normal Amiga ram limit from nine meg to 3.6 gigabytes. For more details of UK availability contact Jerry Howells at Fast Forward Marketing on 021 333 3563.

Exhibitions group is expanding

DATABASE Exhibitions which was responsible for the pre-Christmas record-breaking Computer Shopper Show at Alexandra Palace has been taken over by the Blenheim Exhibitions Group.

Database was formed in 1982 by the Cheshire-based Europess Group and after five years growth was producing more than a dozen shows a year attracting more than 1,000 exhibitors and almost 200,000 visitors. Two years ago it launched the International Desktop Publishing Show and this year it inaugurated the European Computer Trade Show.

Blenheim is Europe's leading independent exhibitions and conference organiser. Among its 200 European exhibitions and ➤

New cartridge is a developer's dream

DMA Design, the programming team responsible for Blood Money, has moved into hardware. Designed as a tool for programmers, The Monster Cartridge offers many of the features which were popular on toolkits for the C64. A really smart peripheral, it has a Z80 processor and either 16k or 64k ram.

The cartridge has a full 68000 disassembler with automatic disassembly from the Program Counter on entry. A copper disassembler shows hardware registers with proper names (COLOR0 rather than $180). Just the thing for examining hackers' demos.

All standard monitor commands are available, including the ability to dump, edit and search memory. A slow mode option forces software to run at one hundredth normal speed.

The software for the Monster is on disc. This is great for easy upgrades or customising the software. The Monster64 has some extra special features: A hi-res monitor screen, DMAdos to allow the reading and writing of data even if the operating system is completely dead, and screen grabbing that saves the current screen as an IFF file.

The success rate in being able to stop any software, take over the display, have a look around memory and disassemble is claimed to be 100 per cent.

DMA Design will produce poke sheets for many popular games allowing infinite lives and energy.

Software is being written to allow recovery of data after a guru crash. If for you are typing some text or source, and the Amiga gurus while saving, press the monster button, use the SEARCH command to find the text and then use DMAdos to save. Converting files from DMAdos to AmigaDos is simple with the utility provided.

The Monster cartridge will even interrupt disc loading and resume the load for all types of disc access.

Pricing is not yet final but expect around £70 for Monster16 and £90 for monster64.

The Monster Cartridge is available for the A500/A1000 and plugs into the expansion bus. It does not carry the bus through, which means it won't work with an A590. A card for the Amiga 2000 is a possible development.

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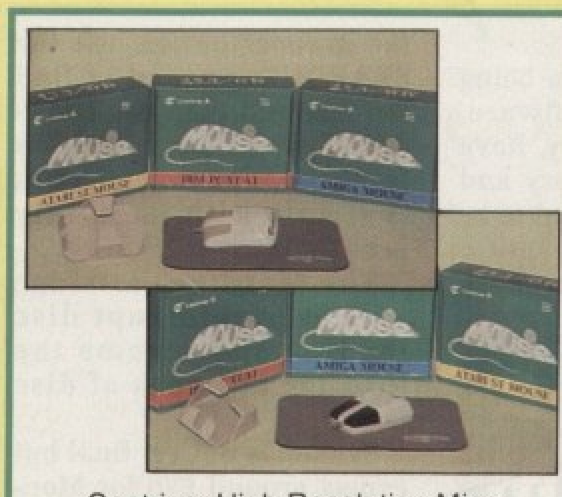
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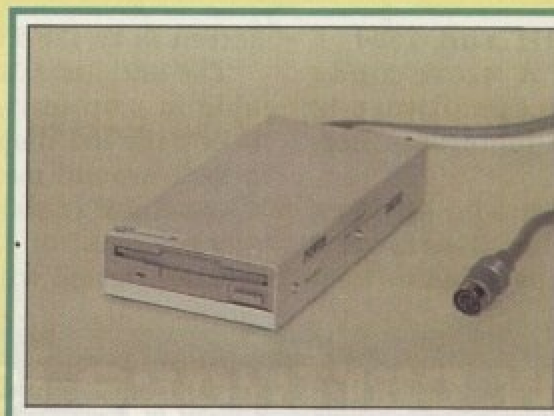
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conferences are 70 based on information technology.

"Database will significantly strengthen our existing portfolio of successful information technology events", said Blenheim's UK executive chairman David Jones. "There is clearly tremendous potential to accelerate the moves Database have already made into continental Europe by networking with our pan European capability".

Managing director of Database Michael Meakin added:"Joining Blenheim will open up many new avenues for developing the company in the international computer marketplace. The outstanding success of our first European Computer Trade Show underlined for us the importance of expanding into Europe and with 1992 coming ever closer we intend to capitalise on the increased export opportunities that are rapidly becoming available".

The present directors of Database Exhibitions will remain with the company.

GCSE packs for Amiga

EDUCATIONAL software house LCL (0491 579345) has launched Amiga versions of three of its best selling programs.

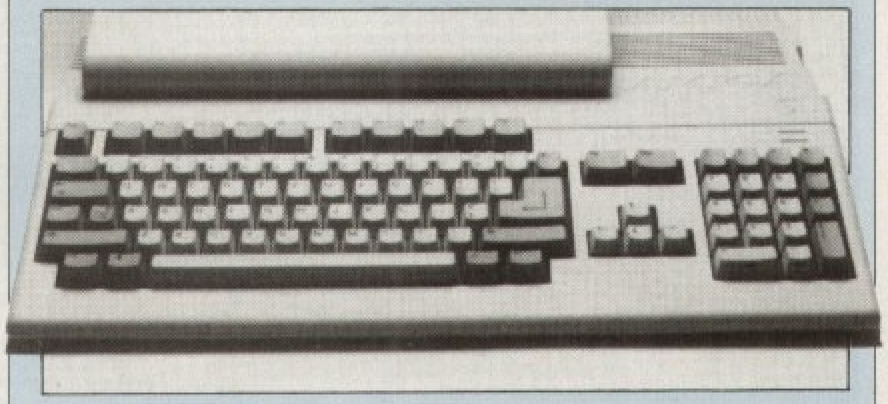
Taking pupils from 11 years up to GCSE, Micro Maths ranges from simple topics such as averages and percentages up to advanced work including calculus and matrices. Each program includes instructions, an unlimited number of problems and complete explanations of wrong answers.

Covering an age range from eight years old up to GCSE, Micro French emphasises practical French using passages from newspapers and signs found in France.

It also teaches users how speak French and is considered suitable for travellers as well as students.

Also spanning the eight to GCSE range, Micro English includes more than 580 questions with some programs incorporating real speech to back up the written work.

All LCL courses have been adapted to fit in with the national curriculum and consist of 24 programs, two books and a voice tape where appropriate. They each cost £24.



Amiga link for Z88

FULL use is made of the Amiga's intuition in a new link-up with the Cambridge Z88 from Music Suite (0239 710594).

Z88-Amiga link provides a friendly interface for archiving Z88 files on Amiga discs. It converts Z88 files for the Amiga's ProText and Scribble word processors and vice versa, converts Z88 files for use on Superbase, can send Z88 printer output to parallel printers and is also available in French and German language conversions.

The software costs £19.95 and link cables £12.95.

Stop thief

SOFTSTORE is offering a reward of an Amiga 500 for information leading to the conviction of thieves who stole a Vortex hard drive, serial number SN 98010741 A, a Roland CM32 music module, serial number ZA 31142, and a couple of Amigas. If you can help please ring Alan Batt on 0628 668320.

Hackers get respite

NEW laws to curb computer hacking have been left out of the Government's proposed legislation for the coming year.

While Secretary of State for Trade and Industry Nicholas Ridley commended the recent Law Commission report on computer misuse (see *Amiga Computing*, January) and recognised that it is a nettle which must be grasped, he has surprisingly failed to act.

A spokeswoman for the Department of Trade and Industry said: "The government has a heavy legislative programme for this session and other matters have taken precedence"..

DIY Midi interface kit released

GOOD news for do-it-yourself electronics enthusiasts who like to make music with their Amigas.

Alba Computing (031-316 4171) has launched an easy to assemble Amiga Midi interface kit which allows the Amiga to interface directly to a Midi network of synthesisers, drum machines and other computers.

"The interface is unique because it can be used with the Amiga A1000, A500 and A2000 models by the simple flick of a switch", said Steve Simpson of Alba.

It includes an etched PCB with component reference guide, opto-isolator and all the necessary resistors, capcacitors, sockets, connectors and cables. Price, £23.95.

Commodore picks new marketing team

BEEFING up its European operations, Commodore has formed a new marketing arm led by marketing vice-president of Commodore International Peter Bayley.

Called Commodore Marketing International, its brief is to bring a consistent and aggressive approach to the marketing of Commodore products through its European subsidiaries.

After joining Commodore from Compaq last summer, Bayley takes the roll of managing director with the new organisation and has gathered about him what is claimed to be "Europe's most powerful IT marketing team".

Director of product marketing is 37-year-old Jim Horsborough who was previously international marketing manager with Lotus Development International.

Director of channel strategy is Peter Turner, 40, who was UK general manager of Amarante, a subsidiary of Trinitech.

Taking on the directorship of marketing communications is 42-year-old Mike Grant, the former vice-president of international marketing services and communications with ICL and director of market research is Eddy Marie, 43, a multi-discipline, multi-lingual consultant who joins Commodore Marketing International from Cegos Makrotest.

Completing the line-up is director of strategic marketing Simon Dismore, 33, from NEC.

"We are putting new and coherent marketing strategies into place and will be providing a degree of support to our national subsidiaries which will enable each of them to take a stronger position in their particular markets", said Bayley.

More people going for IT

COMPUTERS can now be found in more than a quarter of British homes and public attitudes have shown a marked swing towards greater acceptance of information technology. This is revealed in a major survey carried out by MORI (Market & Opinion Research International) and commissioned by Computer Management Group, Europe's largest independent management and IT consultants.

Although home ownership of computers has risen dramatically, serious use of those machines is not so high. Not surprisingly, games are the most popular use with 70 per cent opting for simple shoot'em ups and 26 per cent going for the more serious games.

Twenty six per cent of owners use a word processor, 13 per cent do their accounts on computer, 11 per cent use a database, 10 per cent prepare graphics, and six per cent use spreadsheets and design applications.

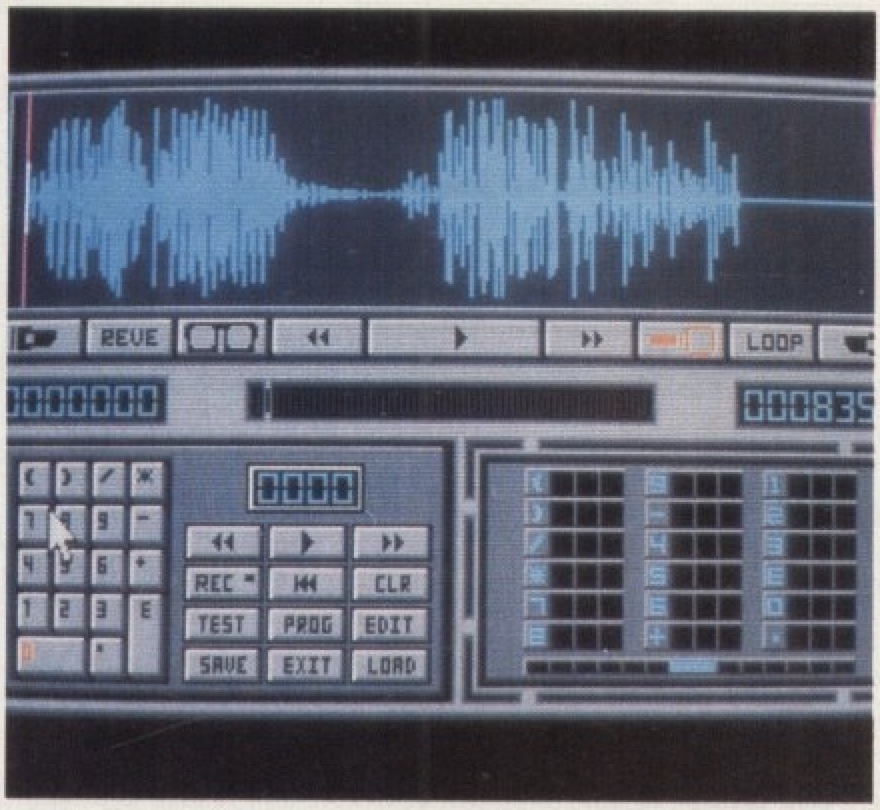
Most dramatic changes are shown in schools. In 1982 less than one out of eight British primary schoolchildren used a computer at school but today this proportion has risen to three quarters. Half of Britain's secondary pupils used computers at school in 1982 but today nearly nine out of ten do so.

Demo discs made easier

MASTER Sound, the latest Amiga offering from Microdeal (0726 68020), is a sound sampler featuring advanced sampling, editing and sequencing software .

It allows users to record sounds into the Amiga from personal cassettes, compact discs and the like. The sounds can be edited in a wide variety of ways then incorporated into demos and programs or played back along with other samples. Master Sound's editor includes a realtime spectrum analyser and oscilloscope which allows users to monitor frequency content and volume thus ensuring that sample quality remains good.

The Master sound demo allows sequenced sounds to be played back from the sequencer while displaying IFF picture files. Master Sound for the Amiga costs £39.95 plus £1 postage and packing.



Microdeal's Master Sound Editor in operation

Learning at home

PARENTS who would like to start their children reading before school age or give them valuable back-up tuition while at school will soon be able to enlist the help of their Amiga with a home version of Play and Read from educational software house Prisma (0244 326244).

Play and Read features a central character called Prof who helps children learn to read and includes five illustrated reading books plus story cassette. There are also plans for a schools Amiga version.

"Play and Read has proved so successful in schools that the logical next step was to publish home versions", said Prisma's Jason Salisbury. The Amiga version is likely to cost £29.99.

They gotta horse

CHOOSING winners, not zebras is the boast of the latest betting program to hit the Amiga market - The Tipster from T.A.M. Marketing (0392 215485).

Complete with instructions and a fast entry data sheet, the program stores race information to give punters selection tips on each horse the next time it is running. The Amiga disc contains a program which installs The Tipster onto a hard drive.

It will evaluate national hunt and flat races and will also accept handicap and non-handicap races covering up to 999 horses and an unlimited number of races. Necessary data is entered from The Racing Post, start-up help is available on helpline for 30 days and on Read Me files. Available by post, The Tipster costs £29.95.

Mail mix speeds the message

THERE are some cases where the old and the new can be combined to advantage and this is currently being shown by the MicroLink comms service.

Now fully operational is its Telemessages facility where a message starts its life in the ulta-modern realms of electronic computer mail and ends up being delivered by the postman.

This Email start and snail mail finish is not the paradox it seems. Allowing for the fact that not everyone has a telephone but all have a postal address, it provides MicroLink subscribers with an even wider base for communication.

Users key in their message which is then transmitted to a post office in the recipient's area from where a print-out in an envelope is delivered to the door.

The service is aimed at that urgent message for a host of recipients who may not have telephones but need to be contacted with all speed.

Network deal

CONTINUING its commitment to open systems, Amiga Centre Scotland (031-557 4242) has signed a deal with Syndesis Corporation for the rights to market its forthcoming TSSnet product in the UK.

A software implementation of DECnet for the Amiga range, it provides both ethernet and serial connection and fully supports X Windows.

Computer art goes on show

AMIGA art is alive and well and living in Switzerland. The Gallery Shirley in Geneva recently staged the country's first computer art contest for the Amiga. Entries included drawings in two and three dimensions and animations.

Those taking part were graphic artists, art students, computer enthusiasts and high school pupils. To accompany the event, New Yorker Steve Berkowitz provided music made with the Amiga.

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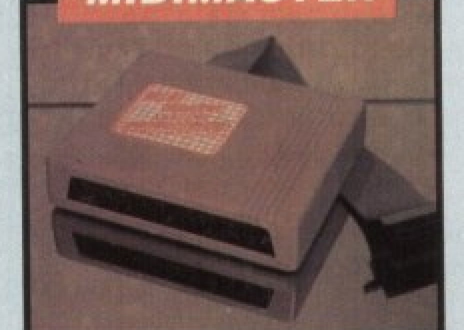
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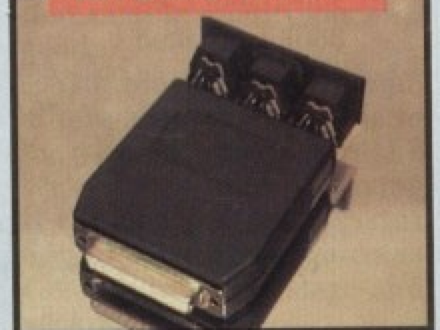
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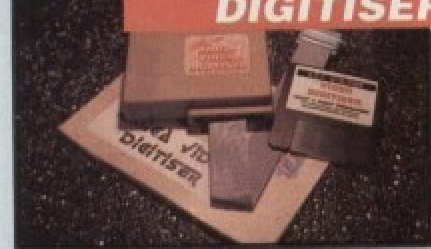
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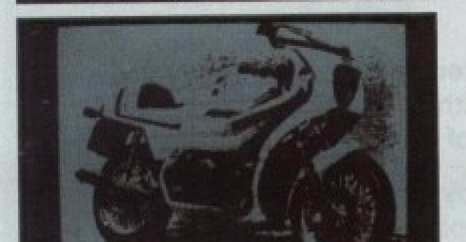


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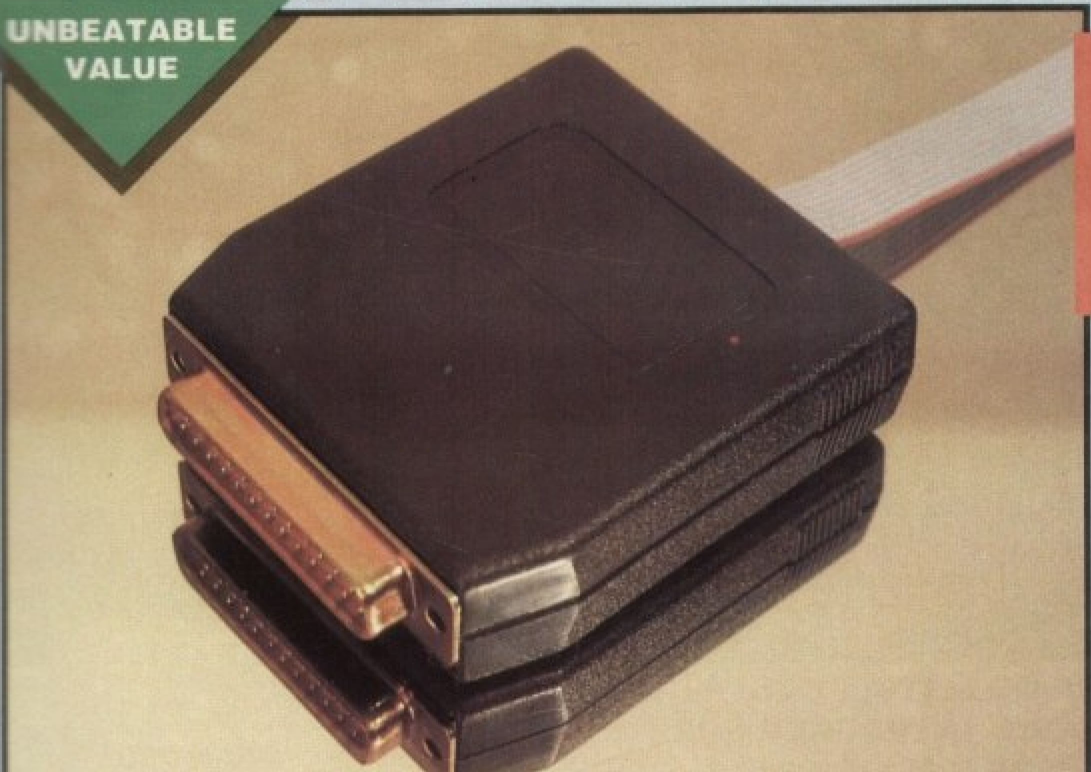
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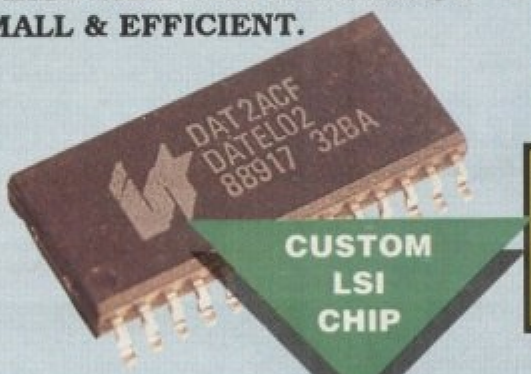


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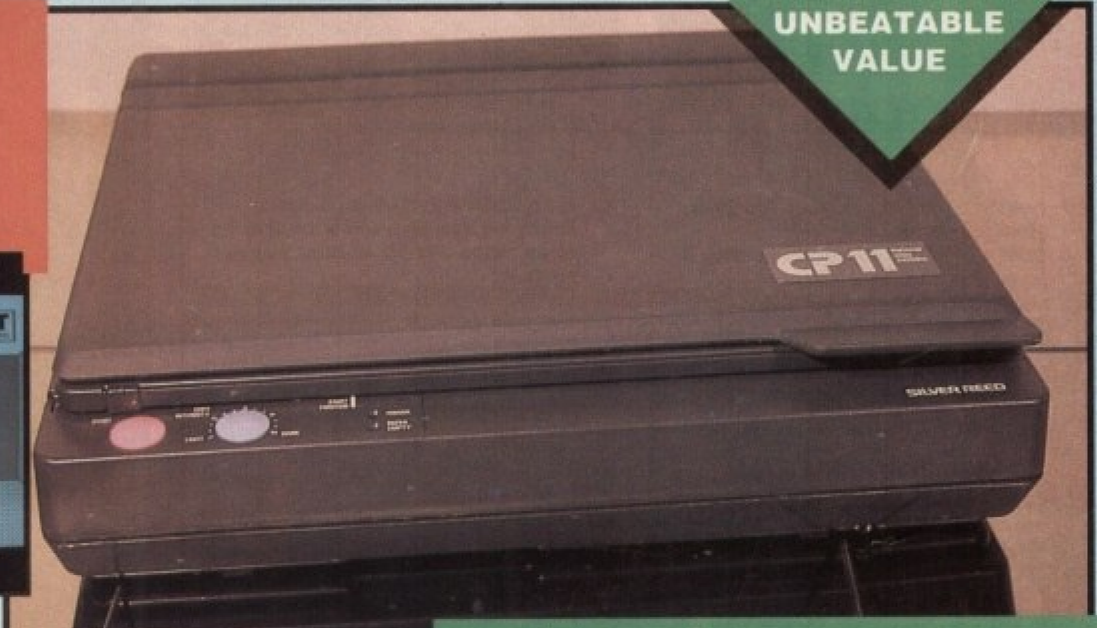
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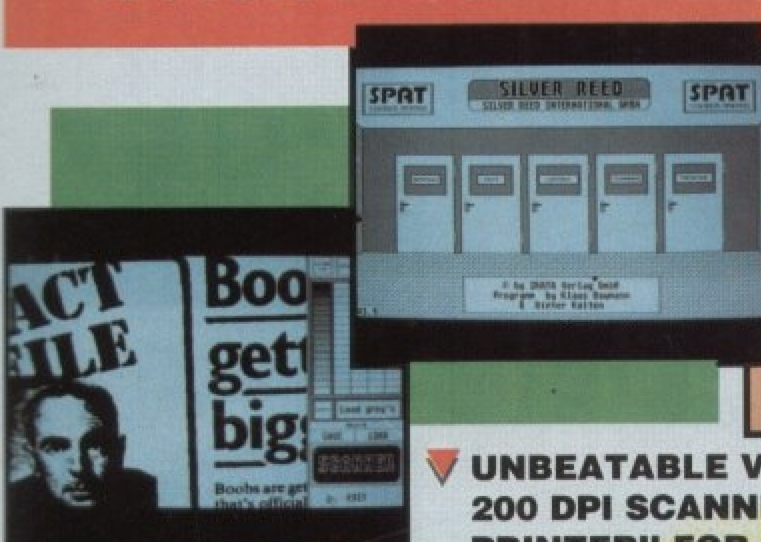
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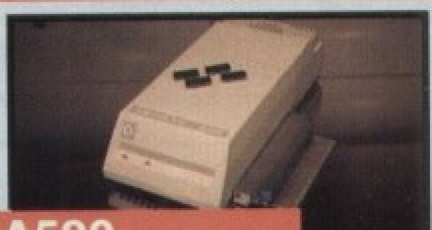
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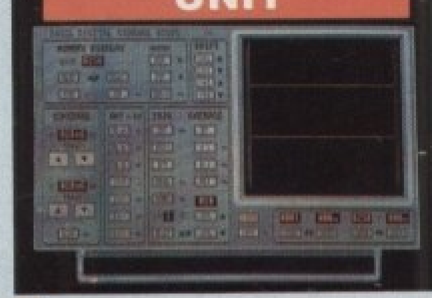


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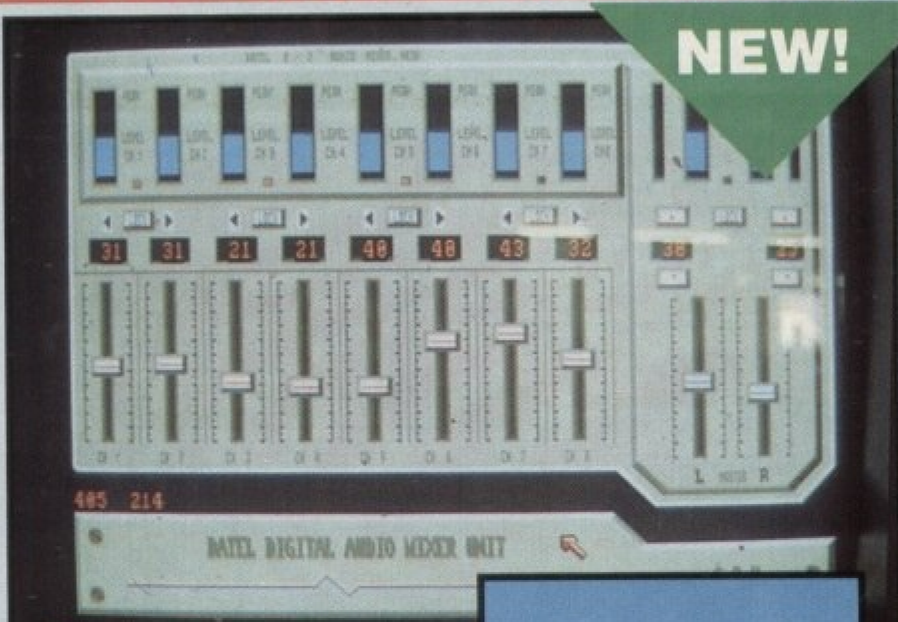


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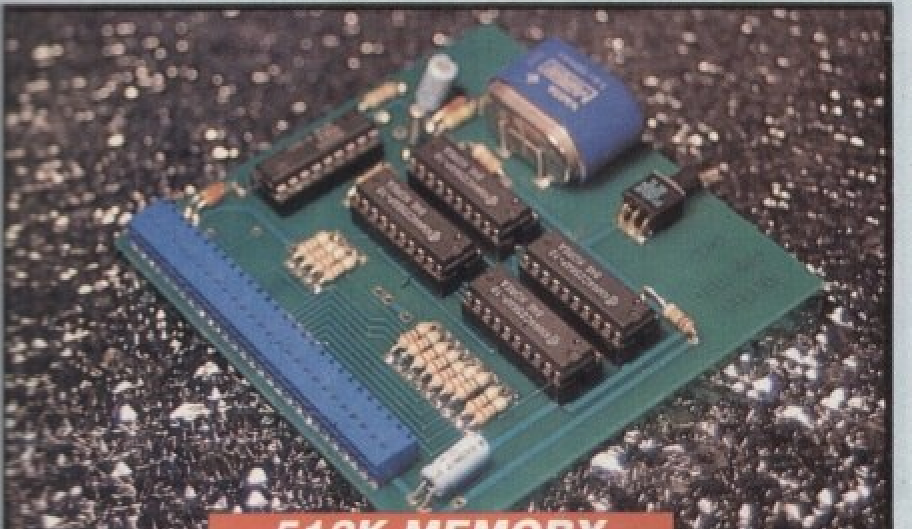
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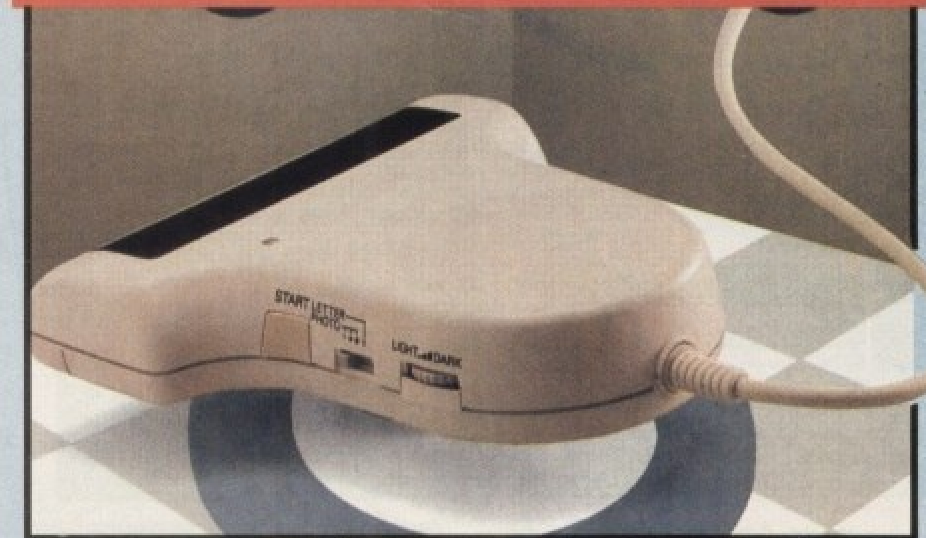
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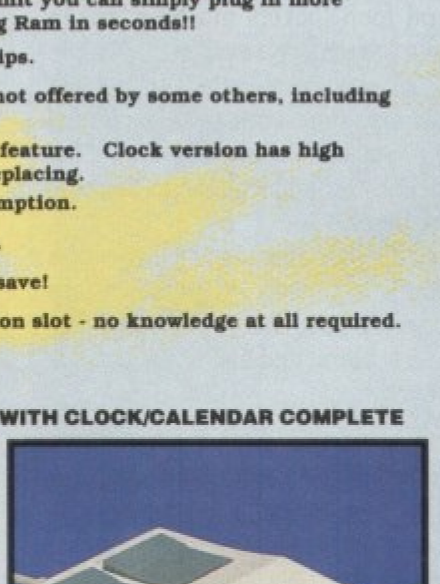


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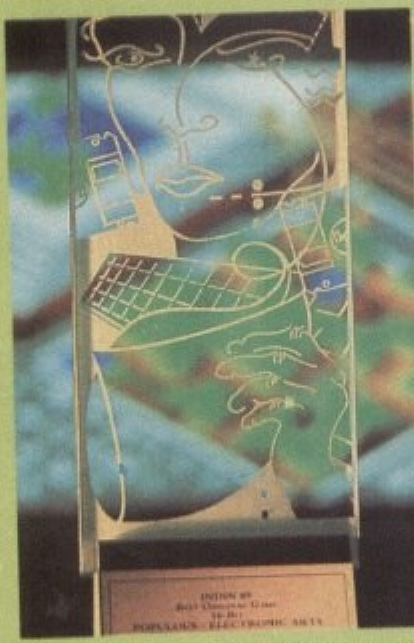
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Amiga Arcade

It's Populous – by a mile!



The trophy awarded to Electronic Arts and Populous for the Best Original Game of 1989

WITHOUT a shadow of a doubt last year's biggest success on the computer leisure scene was EA's Populous.

In the UK it has been voted by the industry as Best Original 16 Bit Game of 1989. The developer, Bulldog, has been awarded the coveted title of Programmer of the Year.

At the Tilt awards in France, Populous picked up Best Strategy Game, while Sweden's leading magazine, Dator, voted it not only Game of the Year but Game of the Decade as well.

Sales of the game across Europe on the Amiga and ST have now passed the 80,000 mark. Bulldog is currently coding Populous II for release later this year.



Burn and rule

DWARF MOUNTAIN lies at the heart of the Land of Anrea. At its summit stands a great castle. Three people crave the secret of immortality that lies within the throne room.

This is the scenario for Dragons Breath, the new game from Palace Software coded by Andrew Bailey with Simon Hunter on graphics and David Hanlon on sound.

It can be played by up to three people, any of the characters being controlled by either humans or computer.

Throughout the game each player will have to buy information and ingredients for spells from passing traders. Building a fighting

Cartoon coin-op conversion

TENGEN is proud of having the rights to Escape from the Planet of the Robot Monsters, a game which catapults you into the thrilling world of comics, it says here.

An army of reptilions has enslaved the humans stationed on Planet X; they are being forced to create a robot army destined to destroy Earth! You take control of Jake and Duke as they fight their way through hordes of robots in search of Professor Sarah Bellum.

At the end of each factory level the heroes are shown their reward status and must race to the next factory to set free more captives.

Points are earned for each captive freed, but it is hungry work and food lockers must be broken into to gain extra energy.

Escalators can be a real problem because they have to be switched on to get them moving – and the switch is, of course, never near the escalator.

"It's like opening the pages of a comic", Tengen PR person Clare Edgeley told *Amiga Arcade*. "The presentation and feel of the game is superb".

Robot rugby



CYBERBALL is a game played by robots – American Football at its most violent, full of colliding metal and exploding shrapnel.

You can choose your team from the likes of the Los Angeles Assassins and the New York Enforcers and select from more than 100 offensive and defensive plays.

The challenge of the game lies in working out the right tactics to annihilate the opposing team. The ball, some 3ft in diameter, weighs 350lbs and is made up of steel and high explosive. The robots are 20ft tall, 8ft wide and weigh in at 2,000lbs.

Converted from the Atari coin-op by Tengen, Cyberball costs £19.99 and is in the shops now.

NEW out the 16 Blitz label is Hunter Killer, a combat submarine simulation developed in the States by Solarco.

You embark on a series of missions from straightforward search and destroy sorties to escort duties modelled on real WWII campaigns. There are 11 different submarines and 14 separate missions to attempt at a range of difficulty levels, as well as practice patrols.

Hunter Killer claims to outclass



Hunter Killer, budget submarine simulation from 16 Blitz

All the latest news on the games software scene



Dragons Breath, although essentially an arcade game, draws heavily on fantasy role-playing imagery

force of dragons will help you to capture, govern and retain villages.

Your ultimate goal will be to find and retain the parts of the talisman which, when complete, will take you to Dwarf Mountain.

"This is not a game to be played in five minutes", Palace boss Pete Stone told *Amiga Arcade*. "Depending on the skills of the individual players, a game can continue indefinitely".

Dragons Breath will be out in "early 1990" priced at £29.99.

DELPHINE'S highly acclaimed Future Wars: Time Travellers received two major awards at the Tilt D'Or ceremony in Paris recently – Best Adventure and Best Soundtrack – *before it had been released!*

ZZKJ is coding Harley Davidson for Mindscape. The game will let you choose different set-ups for different situations, the race scene being just one of them. It is scheduled for an April release.

REVIEWED THIS MONTH

109%	Battle Squadron
100%	Stunt Car Racer
94%	Space Quest III
93%	Indy Adventure
89%	Sim City
85%	Hard Drivin'
84%	Laser Squad
78%	Time
69%	Darius+
62%	Weird Dreams
53%	Nevermind
53%	Knight Force
26%	Hellraiser

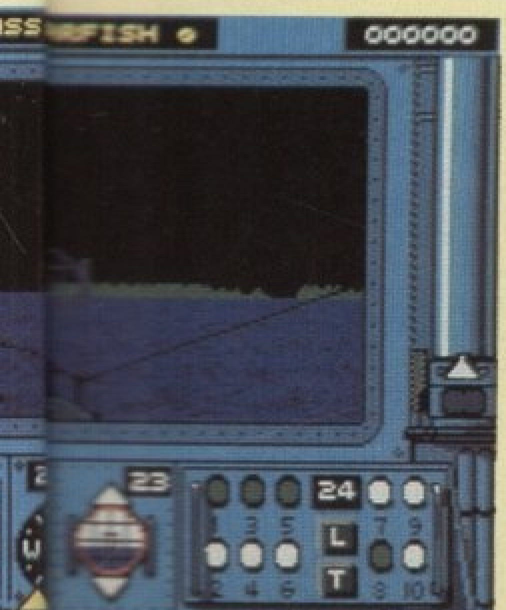
MAX HACKS

- **Hard Drivin'**
- **Peter Beardsley Football**
- **Rock'n'Roll**
- **Stormlord**
- **TV Sports Football**

Budget releases

submarine classics like Silent Service and Hunt for Red October. Only time will tell, but at £4.99 it seems to be outstanding value.

Hot on the heels of Hunter Killer will be two more original titles on the 16 Blitz budget label – Conflict, a simulation of the politics and economics of the Middle East, and Grimblood, a gothic whodunnit written by Mike Singleton, the name behind such classics as Lord of Midnight and Shadowfax.





The Guardians send you off on a mission in Broderbund's Typhoon Thompson

A life on the ocean waves

BRODERBUND is to release the Amiga version of Typhoon Thompson. Taking control of a one-man jet sled, you must find and rescue a baby being held captive by the sea sprites of the ocean planet Aguar.

High speed chases are the order of the day, and controlling your sled in pursuit of an escaping sea sprite is no easy matter. Catching the sprite is even harder.

The challenge lies in jetting to each of the many clusters of islands to find a weapon. To get each weapon you will first have to deal with the flyers and then the sprites. The flyers jump out of the islands and have to be shot. Each has a different property and will try to push you around, sink your sled, suck you towards them or zap you permanently.

Having seen off the flyer you turn your attention to the cutesy sprite which is legging it away from the island as fast as it can.

Hang around too long and it will change into a fish and rush back to the island – and then you'll have to start the process all over again.

Typhoon Thompson will cost £19.99 and is scheduled for release late February.

Gallup Chart

		Last Month
1	Batman – The Movie Ocean £24.95	2
2	Chase HQ Ocean £24.99	NE
3	Hard Drivin' Tengen £19.99	NE
4	Robocop Ocean £19.99	8
5	Xenon 2 Imageworks £24.95	1
6	Shadow of the Beast Psygnosis £34.95	3
7	Interphase Imageworks £24.99	NE
8	Op. Thunderbolt Ocean £19.99	NE
9	Stunt Car Racer MicroProse £24.95	5
10	Ghostbusters II Activision £24.99	NE

New recruits for MicroProse

HAVING decided over a year ago to source and develop software in the UK, MicroProse, the American software house famed for its war simulations, has at last got round to forming an in-house development team.

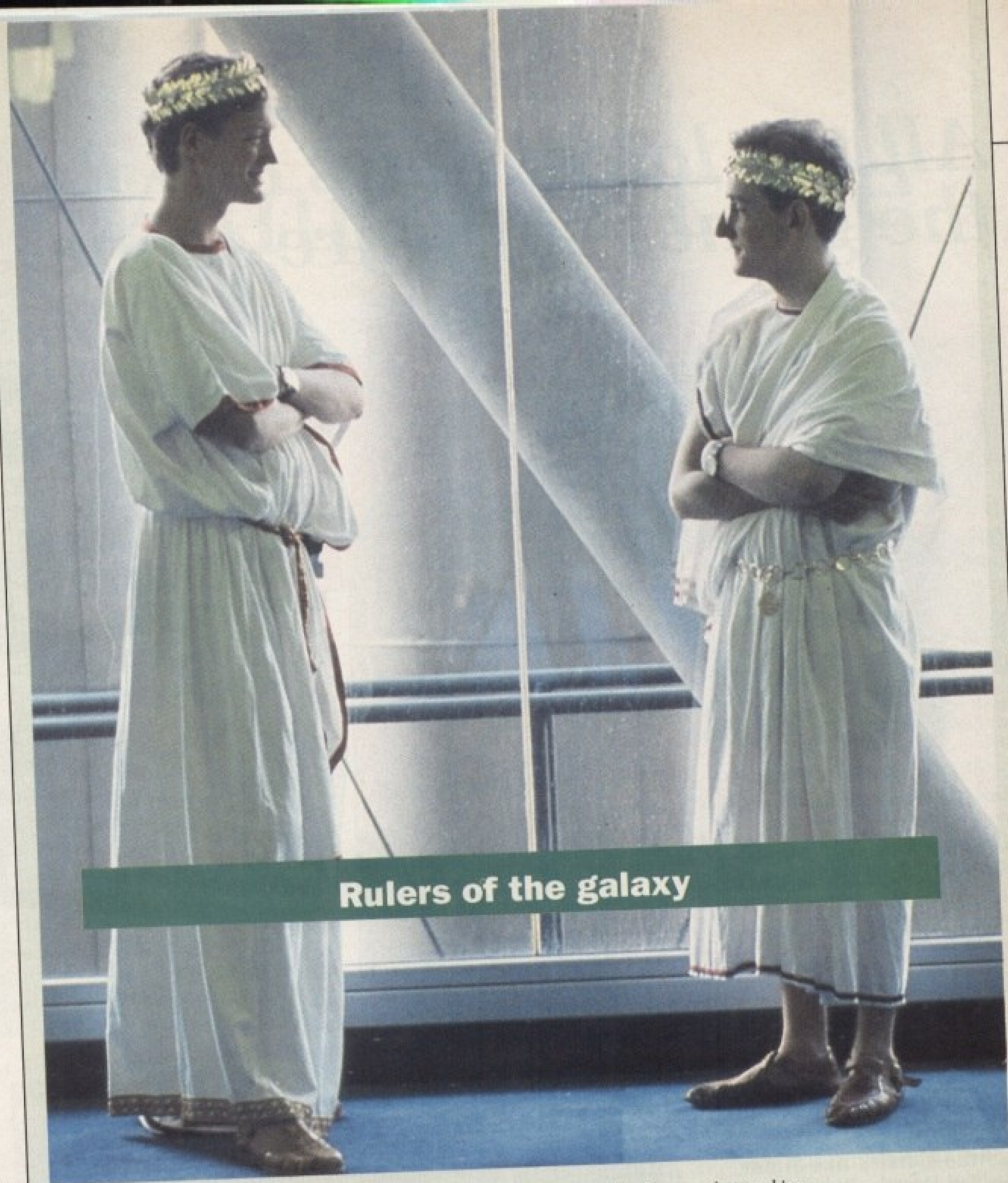
Three programmers have already been recruited, Malcolm Hellon, Tim Walter and Adrian Scotney, with more expected this month. Their main arena of work will be in the coding of original simulation games and aiding in the conversion of MicroProse US products, traditionally written on the PC, to the Amiga and ST.

Amiga Arcade wishes the new team every success, and hopes this new era of growth for the company will help to prevent bugs creeping into the Amiga conversions of MicroProse games.



From left to right: Malcolm Hellon, Tim Walter and Adrian Scotney, the core of MicroProse's new in-house 16 bit development team

Rulers of the galaxy



Imperium programmer Nick Wilson (left) and game designer Matthew Stibbe discover that working for Electronic Arts means having to wear the company uniform

THE Electronic Arts' follow up to The Hound of Shadow will be Imperium, a complex strategy game simulating 1,000 years of human development from 2020 to 3020. Your aim will be to become the last surviving emperor of the galaxy, which will involve manipulation of economic, diplomatic, political and military matters.

Imperium is programmer Nick Wilson's first 16 bit project. He is being helped by game designer Matthew Stibbe, whose past experience is in computer wargames, and graphics artist Karl Copley, the man responsible for the stunning sepia graphics in The Hound of Shadow.

Scheduled for release in March at £24.99.

Bombs away!

WINGS OF FURY – surprise, surprise – is a flying game. Your mission is to provide air support for a heavily damaged aircraft carrier, the USS Wasp, during the final years of WWII. Your plane is a Hellcat, armed with machine guns, bombs, rockets and torpedoes.

The game isn't a simple shoot-'em-up. There are seven ranks under which you fly, each offering a more challenging set of missions and objectives than the last. Remote and close-up views are featured, along with a simultaneous 3D display from the cockpit.

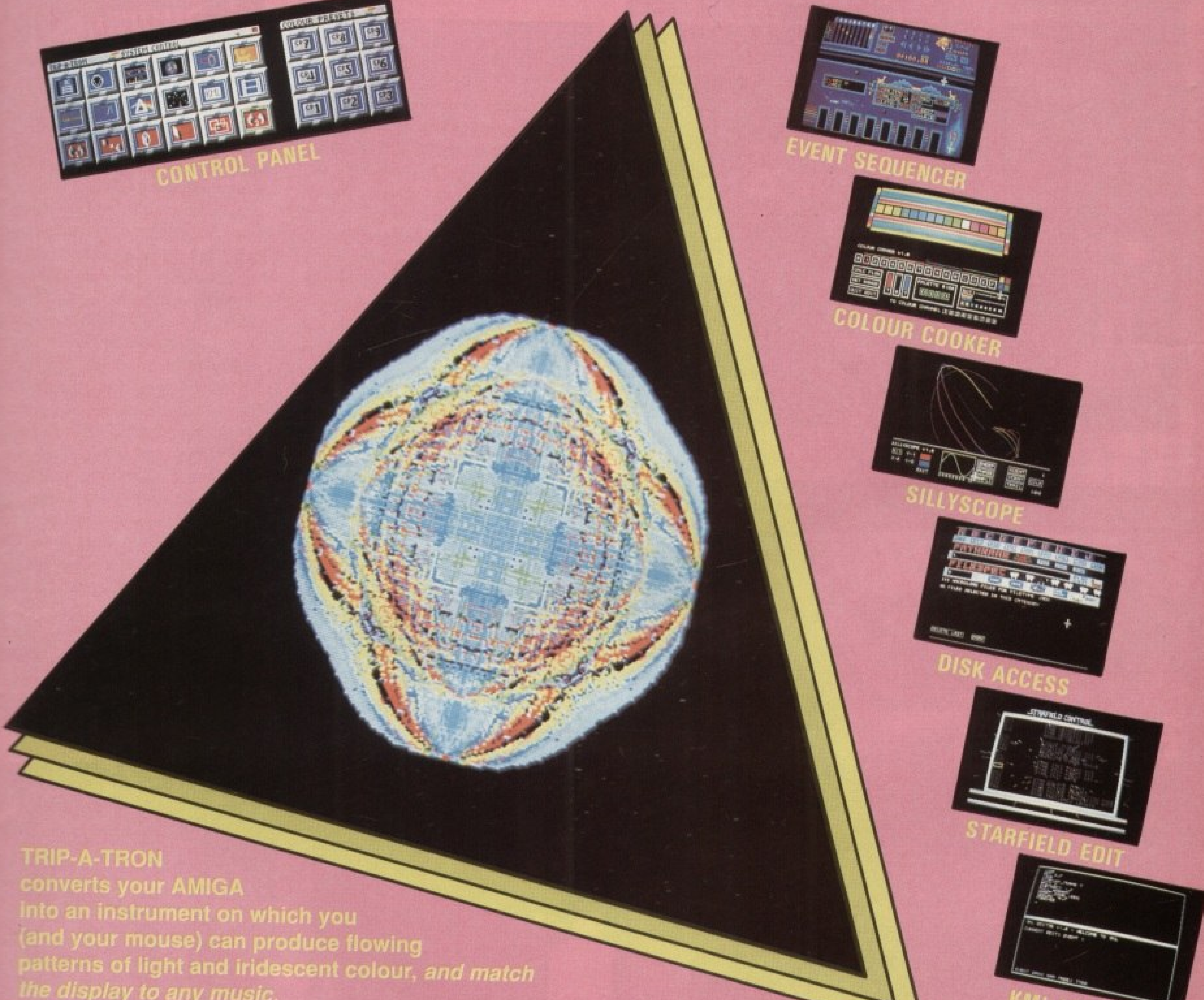
Should be available now at £19.99 on the Broderbund label.



Your Hellcat takes a hit in Broderbund's Wings of Fury

Trip-A-Tron

LIGHT SYNTHESISER



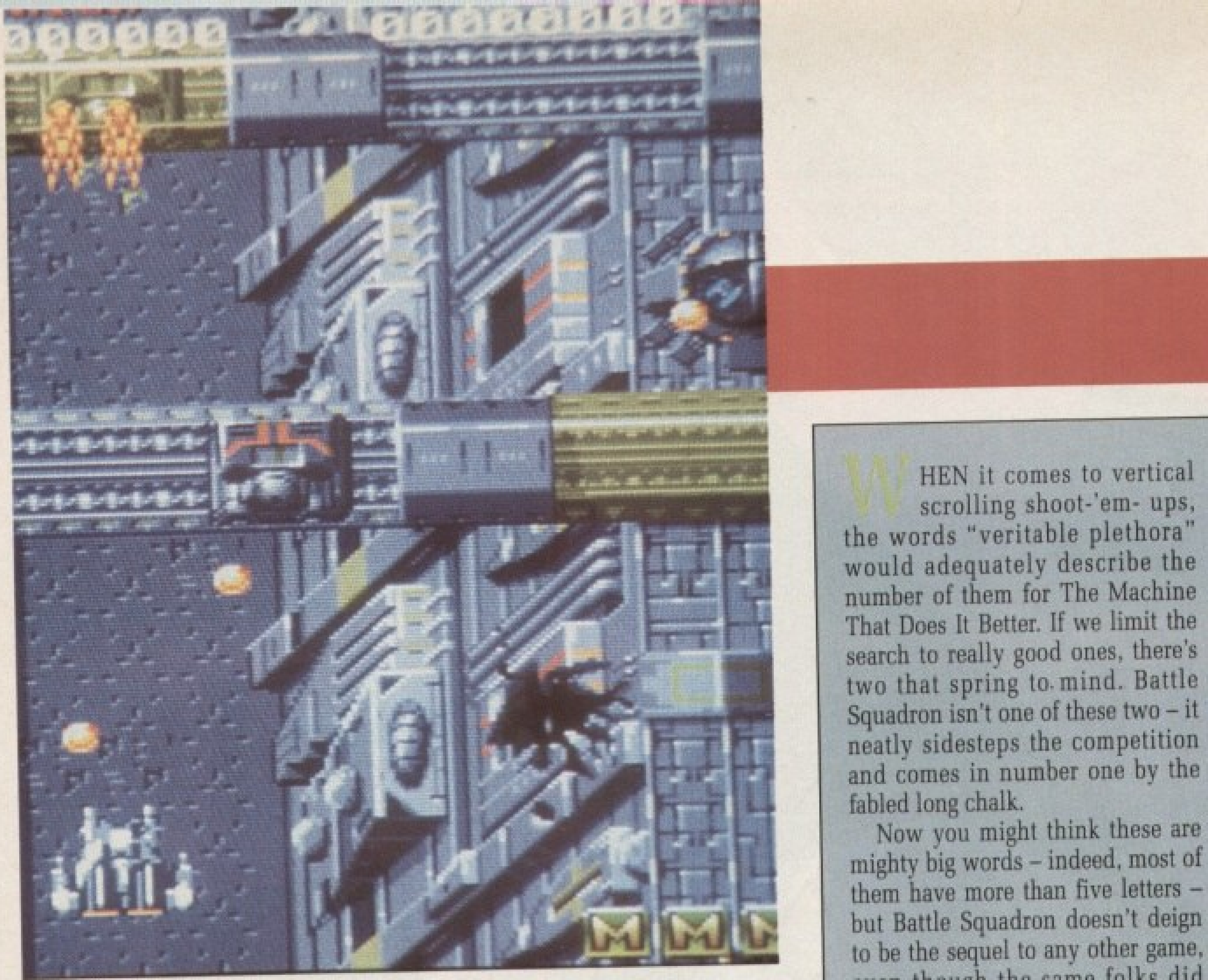
TRIP-A-TRON
converts your AMIGA
into an instrument on which you
(and your mouse) can produce flowing
patterns of light and iridescent colour, *and match
the display to any music.*
THE RESULT is fascinating - pleasure enhanced by knowing that
your sequences can be saved and enjoyed again or *used as performance art at a
disco or by a group.*
SOON THE LIGHT-SYNTHESIST COULD BE UP THERE WITH THE GUITAR HEROES.

AMIGA TRIP-A-TRON with graphics effects allocated to most keys, is instantly useable. It also has its own programming language, KML, and beautifully designed pop-up screens, helping you create an *infinity of unique effects.*
TRIP-A-TRON comes with a comprehensive 145 page manual in an attractive A5 ring binder.

LLAMASOFT

Price - £29.95

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For a shoot-'em-up the game's got a lot of depth; so have the graphics

WHEN it comes to vertical scrolling shoot-'em- ups, the words "veritable plethora" would adequately describe the number of them for The Machine That Does It Better. If we limit the search to really good ones, there's two that spring to mind. Battle Squadron isn't one of these two – it neatly sidesteps the competition and comes in number one by the fabled long chalk.

Now you might think these are mighty big words – indeed, most of them have more than five letters – but Battle Squadron doesn't deign to be the sequel to any other game, even though the same folks did Hybris, which is also in the top three.

Nor does it have a rather insipid tune licensed from somewhere else. Battle Squadron shows that there's plenty of new tricks in the old shoot-'em-up dog.

Style permeates this fabulous production. In homage to the age old tradition, Battle Squadron sports a plot of such horrific inconsequence that it would gag a gameshow host.

Yea, it is written that Commanders Mayer and Bergin were returning from a successful reconnaissance mission deep into the heart of the Barrax Empire.

And, lo, a great big huge ginormous flying thing did appear close by. And the good commanders saw that it had very large guns and had "Barrax" written on its side and generally could be considered by all and sundry as a bummer.

And from this great big huge ginormous flying thing there did appear a tractor beam, and we're not talking Massey-Fergusons here. And it did proceed to draw the commanders' ship towards it and the commanders were a wee bit worried. But in the last garbled message they did manage to say that it won't be much fun getting us out, so you'd better send something pretty zappy.

You are that something. And you have a whole planet to destroy before tea time.

Back in the real world (now the



Cooperation is the key to the two-player game



BATTLE SQUADRON

I bring you love and deeper understanding

coffee's worn off) your elegant little ship is moved about in the time honoured way via joystick, or mouse if you're feeling silly or are player two. Or both.

The play area is a full 256-line, 64-colour (or 32-colour and some extremely clever shading) scroller, with tiny strips shaved off the sides to give it the perfect arcade aspect ratio. Your weapons can be upgraded through more than 25 levels to a degree that the only way the flying nasties can get to you is from the sides. They know that trick, and they use it.

There are some phenomenally cunning enemies that can turn well nigh invisible before trying to catch you unawares. There are also some incredibly stupid ones which have to rely on very thick armour and a very high rate of fire. Both work out equally nasty.

If you took an Amiga running Battle Squadron, put it in a large wooden box and put it in an arcade, it would compete on level terms with dedicated machines with really fast processors and more memory than you could shake a stick at.

The attract mode is very pleasantly noisy, and the fine in-game effects don't seem to suffer any when you have the equally fine tune running. These people really know how to make the Amiga sing.

Everyone went gaga over Xenon II, and rightly so – it was the best available then. But now Battle Squadron is the best. Xenon II scored the perfect 100 per cent. How can we express that Battle Squadron is even better? Hmmm. I'll show you how ....

Stewart C. Russel

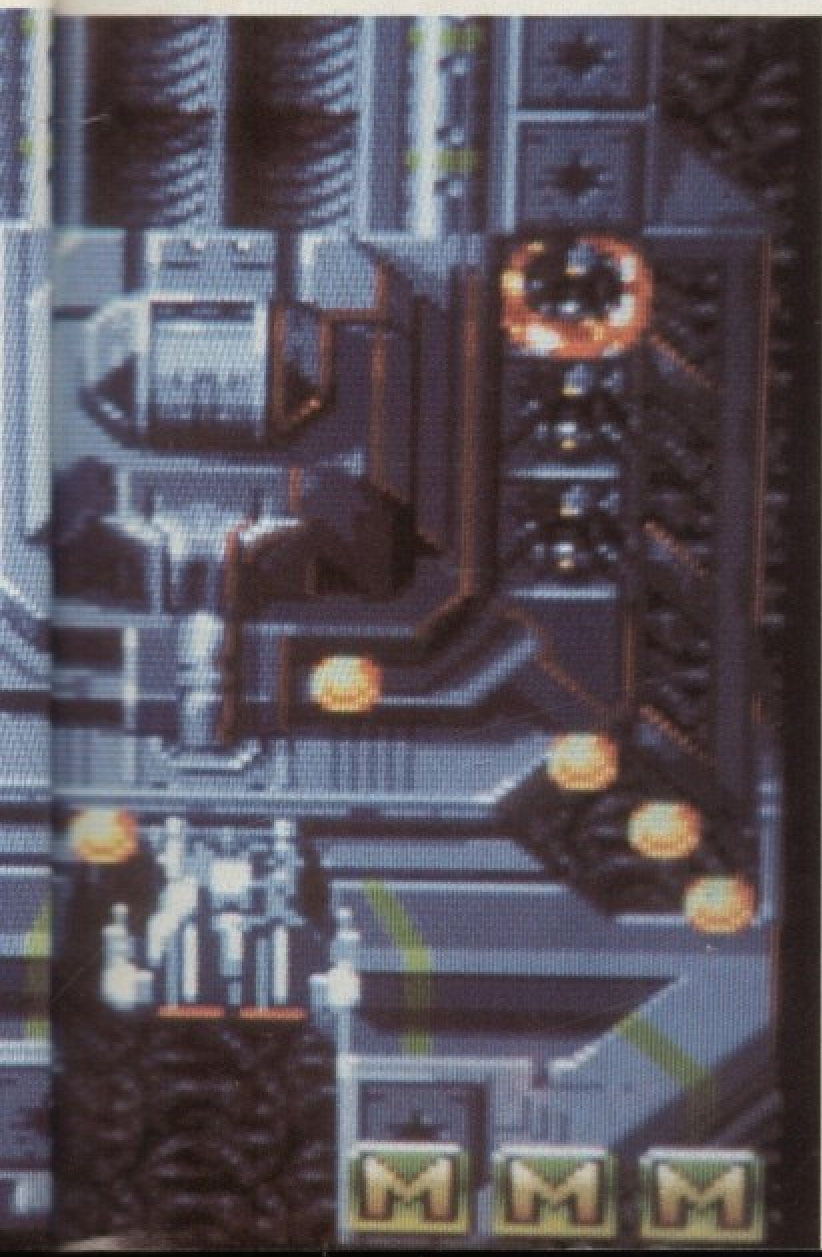
Battle Squadron
£24.99
Electronic Zoo

Sound
Graphics
Gameplay
Value

Overall – 109%



He's turning green! I do believe this alien is about to be wasted!



Hey, buddie, where are you? I need help with this guy

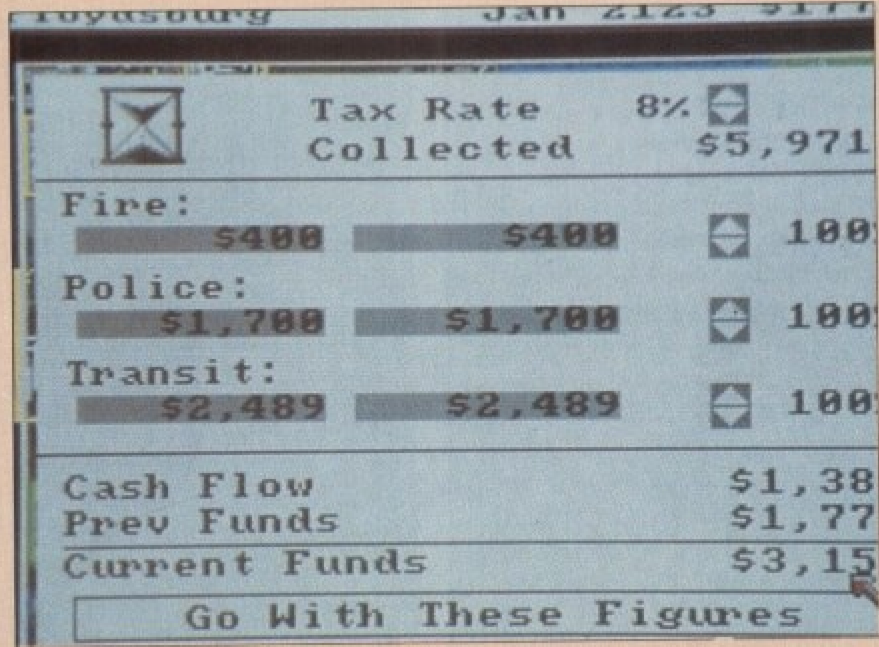


The graphics are so well drawn in parts that you feel you could just reach out and grab them

Excellence

SIM CITY

King for a day, or a century?



If you put the tax up too much everyone will get upset and move to another city

Sim City
£29.99
Infogrames

Realism	
Strategy	
Gameplay	
Value	

Overall – 89%

BEING a mayor isn't, as is widely held, all about dressing up in silly frocks and leading a procession once a year. Well, maybe a bit of it is, but there are some pretty tough decisions to be made too, like what areas of natural beauty to destroy and industrialise, how high to set the rates, building roads to combat traffic congestion and building expensive residential areas for incredibly rich people – like mayors – to live in.

Sim City will terraform a suitable landscape for you and set the clock back to the year 1900. How the New Town development proceeds from here is up to you.

Remember, the social make-up of the town depends on these early stages – one wrong plan and it could be Milton Keynes for thousands of innocents. You are in a position of great social responsibility.

The first thing to do is build a power station – man cannot live by candle alone. Along with this decision comes your first quandary – coal or nuclear?

A coal power station is considerably cheaper, but causes more environmental damage, and pollution is one of the factors that effects population growth. Nuclear, while more expensive, is a lot cleaner unless, of course, you have a meltdown.

Already you are making decisions which will effect the structure of the city to come. In fact, the early decisions are far more important than those taken later on.

Growth of the city will critically depend on how high you set the tax rate and how much valuable land you cultivate for the populace. The initial considerations are for power, transport and zoning regions for industry, commerce and residents.

It is important to note that you do not actually build on any of the zoned regions, your population does. If you zone a residential region in the middle of an industrial wasteland, don't expect many people to go and live there.

The challenge therefore is not merely to provide a certain amount of accommodation for each of the city's functions but to use a piece of land for the purpose for which it is most suited.

Furthermore, each zoning decision you take will effect the suitability of neighbouring property for a particular task, due to reasons of traffic, pollution and land value. As the city grows, so will other factors, like pollution, crime and traffic density.

Police stations are a good idea, and if you are planning for a Pudding Lane then a few fire departments might go down well, too. Of course, all this costs money, and the only place to get it is via the annual rates demand. It's a good thing you don't have to get re-elected.

Just when you think you have it all worked out the trade figures suffer a slight blip, commerce slumps, the taxes must go up and before you know it the last of the fleeing population have you hanging upside-down in your lovingly sculptured town square.

Presentation doesn't mean much in a game like this, but great care has been taken to make your metropolis look as brilliant as it was designed.

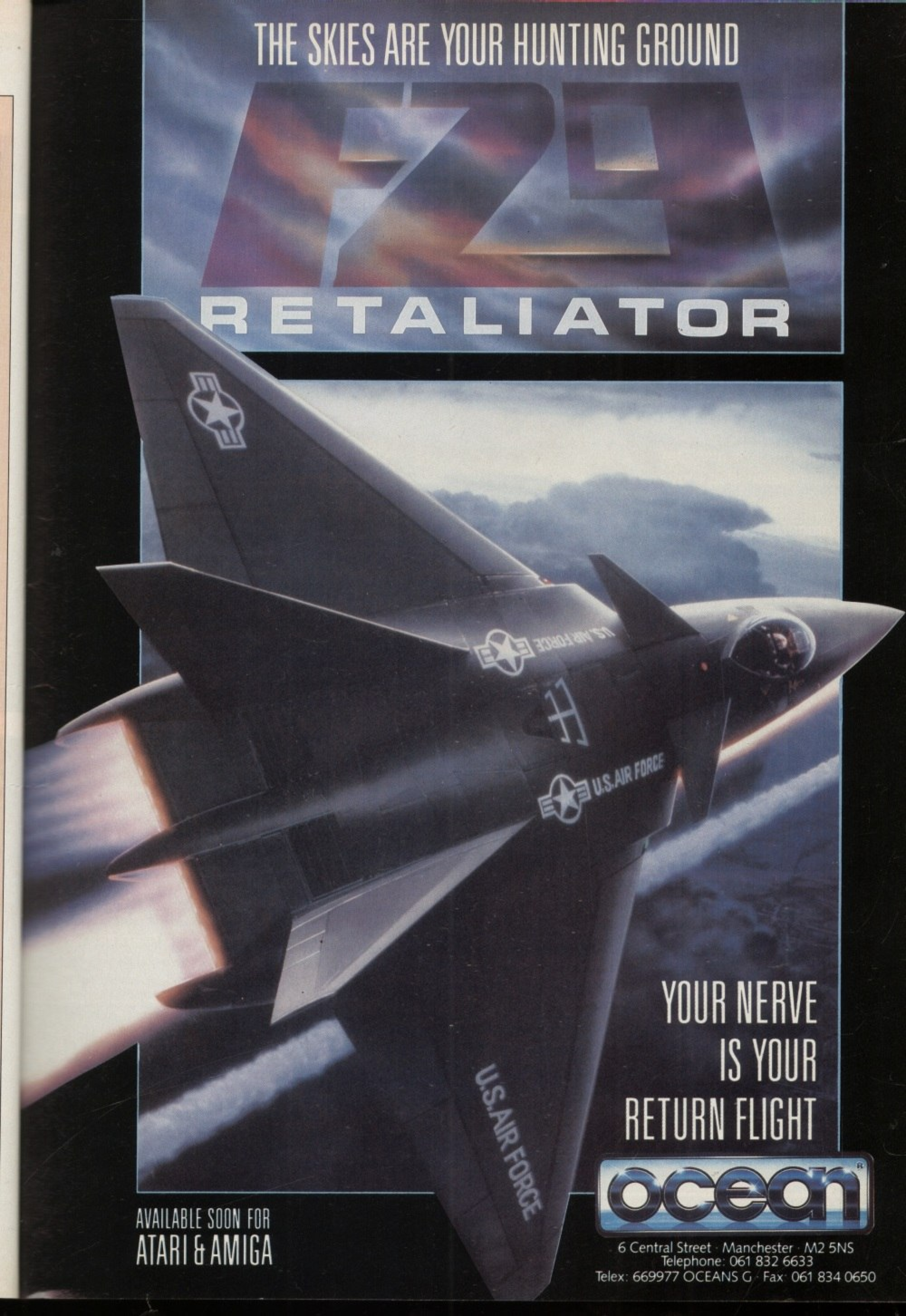
Sim City follows the simple philosophy of a game called Kingdom, which was widely popular in the days when programming meant wearing a white coat and flicking switches – define a few simple rules that describe a reality and then explore the mathematics. This it does excellently.



Not many people around, better have a few electricity cuts this evening



Green Hills – the very expensive part of Floydsburg



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SPACE QUEST III

The Pirates of Pestulon

Excellence

FROM space it came. Carried by the solar wind, the escape capsule bearing the seemingly lifeless body, drifted across the space lanes until it halted, gripped in the searing light of a powerful tractor beam.

Hauled from the void and tipped unceremoniously on to a pile of garbage within a vast ship, you awaken to find the the fate of the galaxy is once more in your hands. Roger Wilco – space hero – has returned.

Elmo Pugg, the evil owner of Scumsoft Software, has scandalised game players throughout the known worlds by kidnapping the two writers of the fabulous Astro-Chicken video game and imprisoned them in his secret lair.

You must find some way to build a working ship from the piles of junk which surround you, fly to the nearby worlds, search for clues and finally rescue the "Two Guys from Andromeda". And it's nearly tea- time already!

Speaking of food, don't forget to stop at Monolith Burgers, the last fast-food parlour before you hit the Milky Way. Monsters from all over the galaxy will be queueing there to pick up a Whoppa-Burger and fries – with added grease.

Your new ship is fitted with the latest laser guns and defensive shields. Your navigation system is fired up and ready to go. There's lots to do and see out there, so let's get the lead out and make tracks for the nearest planet.

This eagerly awaited addition to the Space Quest series is all that game players could wish for. Artists from the world of TV cartoon animation have been assembled to create Sierra's most lavish graphic adventure so far.



Blast off and feed your face at the quickest, fast-food burger joint in the galaxy

Combined with super music and realistic sound effects, Space Quest III is a feast for both eyes and ears. Lucky owners of the Roland sound module will be able to enjoy the even more sophisticated music which the game is capable of producing.

In addition to finding lots of silly objects to help you solve the puzzles – fancy some temperature-controlled boxer shorts? – you must also play a few arcade sequences.

There is a space battle to be fought with pirate ships, a boxing match in which you control a giant robot, plus the opportunity to play Astro-Chicken itself. Visit the Fun-World on planet Phleebut and play Hopscorch across the lava flows on a volcanic moon.

Just in case you thought things were difficult enough, you'll soon discover that you have an additional problem in the shape of an 8ft android. Seems like someone has put a price on your head, and this deadly Terminator intends to collect it the hard way.

He is bigger than you. He can run faster and hit harder than you. And just to make things really interesting, he can make himself invisible.

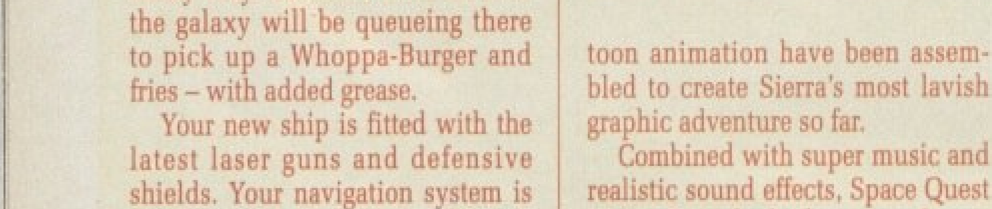
This is both the funniest and easiest of the Quest games and I defy anyone not to enjoy it. If, like me, you enjoy adventures but never seem to be able to finish one, then this is the game you have been waiting for. Even dying is fun because the game has the witty last word every time.

Alan Makepeace

Space Quest III
£29.95
Sierra

Sound	
Graphics	
Gameplay	
Value	

Overall – 94%



Don't happen to have a dead parrot by any chance, do you



Space Quest III features the best graphics to come out of the Sierra stable to date

OXFORD SOFTWORKS

NEW CHESS PLAYER 2150

Winner 1989 British Open Personal Computer Chess Championship



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INDIANA JONES AND

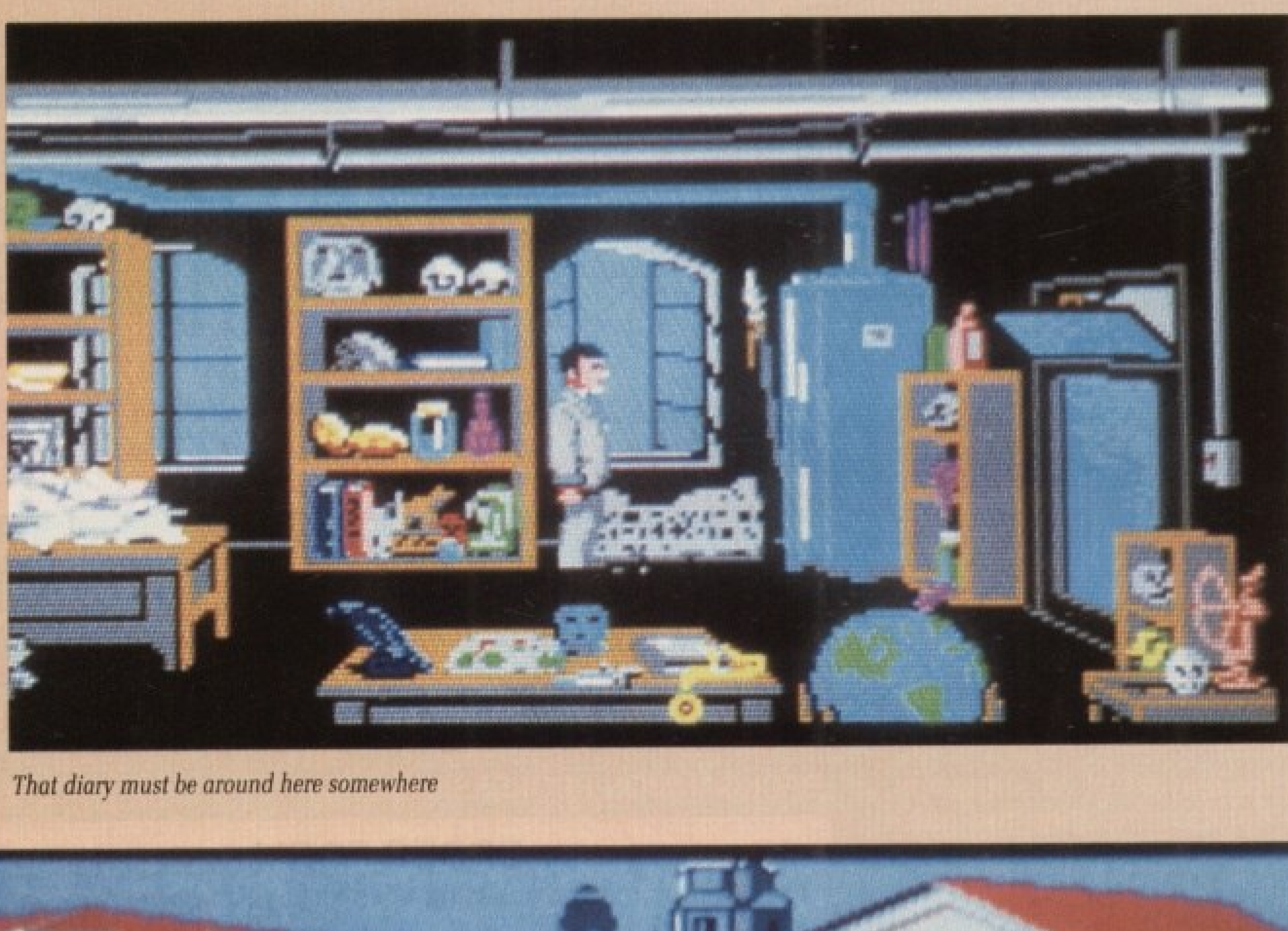
The graphic adventure



Try "push grid" for a laugh

FOLLOWING in the footsteps of the old crusaders, both the Nazis (boo!) and Indiana Jones (hooray!) are searching throughout war-torn Europe for the Holy Grail. With the aid of your father's diary and your bullwhip, you must follow a trail which leads from the rat-infested catacombs of Venice into the very heart of the Third Reich.

Having got yourself into another fine mess, you'll discover that your eccentric father is also stuck in the Wolf's Lair, so it's double trouble for the man in the Fedora.



That diary must be around here somewhere

Before setting off for Venice you can travel to your father's house to pick up some useful objects. If you survive the deadly traps protecting the tomb of the crusader, your trail will lead onward to an old castle in Germany.

Rescuing your father and escaping the clutches of the Gestapo (boo!) will enable you to pay a call on Hitler himself, before you make a further dash in a Zepplin to the Holy Lands.

Here your most dangerous test awaits – three trials of faith must be endured before the secret of the Grail is at last revealed.

To make this adventure even more appealing, all commands use the point and click method, dispensing with typing completely. You may pick up and use objects, and talk to other characters by selecting sentences from an offered list.

In case your fists are faster than your wits, the game will allow you to engage in punch-ups with various bad guys. Where an enemy blocks your progress, you have the option to resort to brute force and give him a right to the jaw.

The game has been designed with many different paths to success. Should you managed to fool the Gestapo (boo!) and escape from the German castle with the Grail diary, you will automatically head for the airport. Otherwise the game will point you in the direction of Berlin and give you the chance to



Just one Cornetto, give it to me...

D THE LAST CRUSADE

Excellence

retrieve the book.

For this reason you may play sections of the game which have not been seen by other players who have completed the quest. A score of Indy's IQ is given to indicate how well you are doing in the solving of the complete game.

From time to time the view of the screen will change to an overhead perspective. This is used in a number of small mazes and in the castle corridors.

The animation and background graphics are first class. The title music and sound effects build up the atmosphere and do a great job of recreating the excitement of the film.

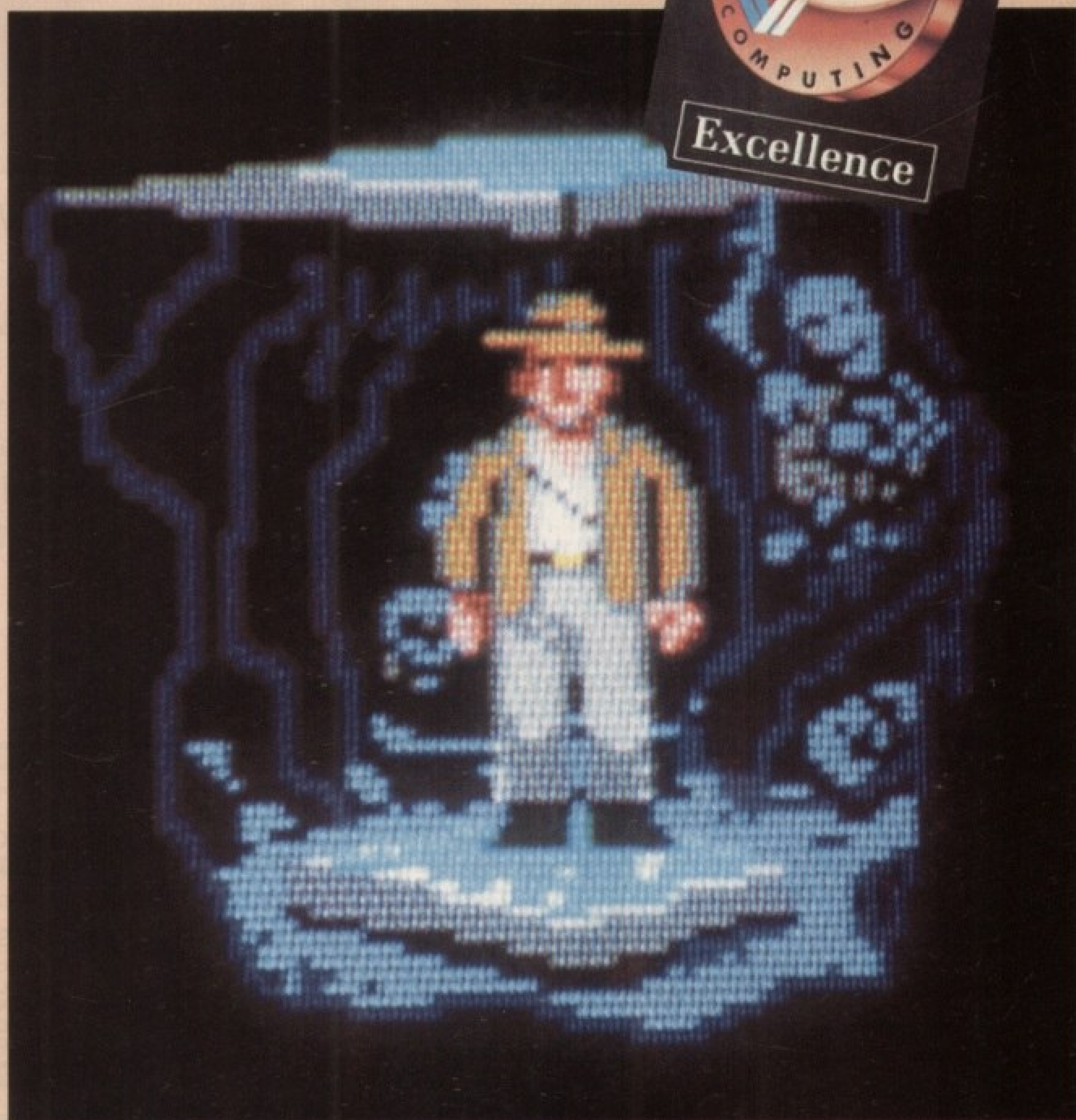
Like the movie, this game is big. By avoiding the temptation to push out a second-rate product which simply cashes in on the film's success, Lucasfilms has satisfied both Indy fans and computer adventurers with a brilliant game.

Alan Makepeace

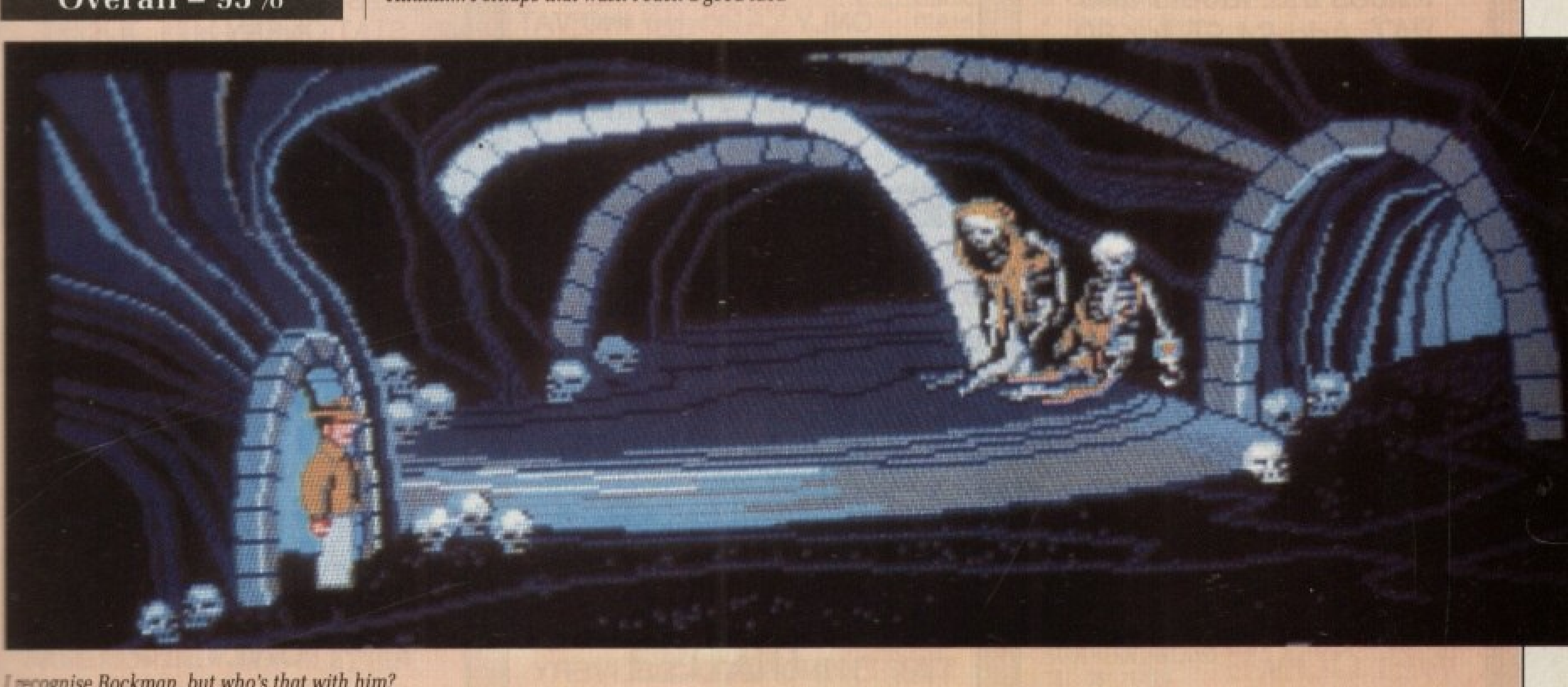
Indy Adventure
£24.95
Lucasfilms

Sound
Graphics
Gameplay
Value

Overall – 93%



Hmmm... Perhaps that wasn't such a good idea



I recognise Rockman, but who's that with him?

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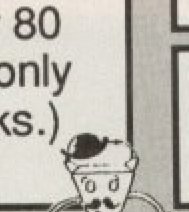
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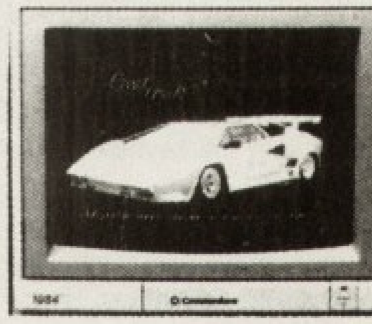
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Software for the 1990s

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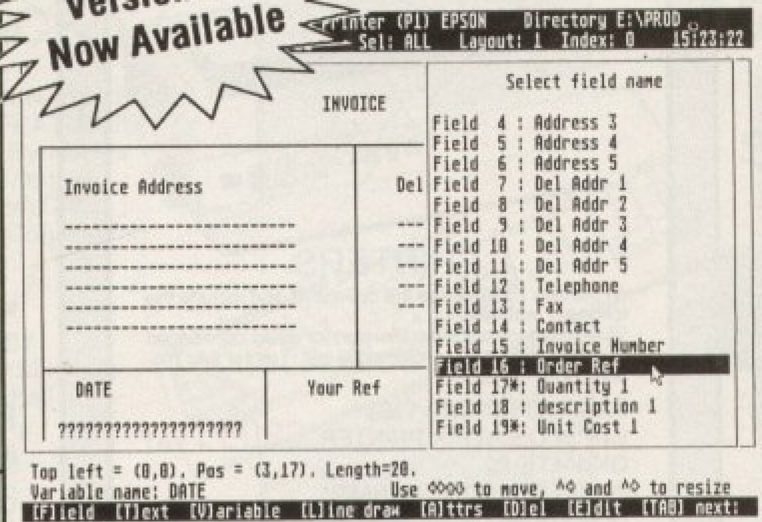
This is the program that our customers have been requesting for years. Prodata is an ideal companion to Protext - it uses the same key strokes and many of the same concepts, so Protext users will immediately feel comfortable. Prodata offers the same standards of ease of use and flexibility as Protext.

But you do not need Protext to use Prodata - it is a powerful database manager in its own right, ideal for all your filing applications. The program uses a simple set of menus which may be used with the keyboard or a mouse, as required.

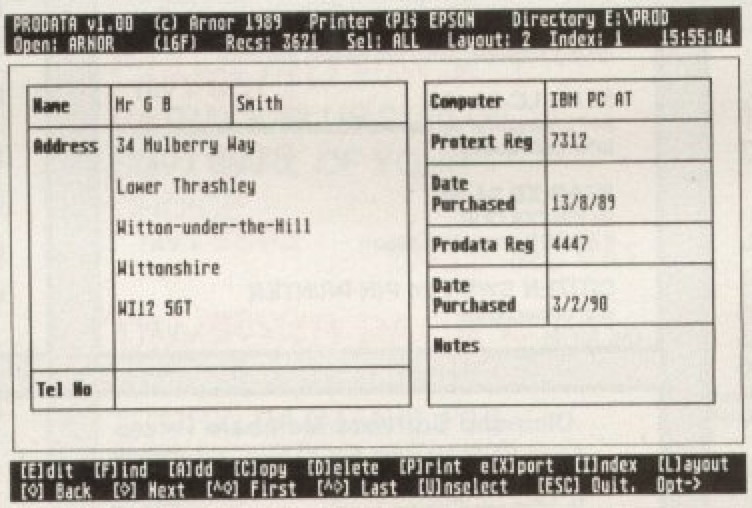
Prodata is available now for the IBM PC and compatibles, Atari ST and Commodore Amiga computers.

Amiga owners please note that you need 1MB to run Prodata - see below for special price for Prodata plus A501 (512K memory + clock expansion).

Version 1.1 Now Available



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NEVERMIND

Life is too short

THERE are some games which have great names and some great games with simple names. Rare is it indeed to find a game which boasts a splendid monicker and has sparkling gameplay. Nevermind is not one of those games.

Rather it is an exercise in tedium with a name that aspires to wit, yet is as sharp as a lump of clay and conjures up images of impoverished mothers patting a brattish child on the head in consolation that Santa did not after all be bring the shiny new mountain bike that was in the window of Toys R Us.

Nevermind is a game which contains the spark of a good idea, but alas that spark has been trodden into the dirt in the galloping rush to produce some sort of game. This is an isometric 3D affair, a reprise of the style made famous by Ultimate some years ago. Unfortunately there the similarity ends, because Psyclapse, in a bid to advance the concept, has led it up a blind alley.

In general, each screen represents or contains a puzzle. Completion of the puzzle leads the player to the next screen. Gravity is orientated to whichever wall you happen to be walking on, which oft leads to much head twisting and turning in order to correctly align the character on screen.

The basic thrust of the game is to re-assemble a picture on one of the walls. Parts of the picture are scattered about all over the room. However, it is not such a simple a matter as walking from wall to wall carrying the pieces and dropping them into the correct position. Instead there are teleport squares, and it is down to you to find the correct sequence of squares to travel around the room.

Pieces of the picture may already be in place, but in the wrong position, so identifying the form of the picture and then assembling the elements in the correct order adds to the mental manoeuvring.

Neither is it as easy as picking up the pieces and dropping them on the picture once you have found the way to get to it. There are chess pieces which steal parts of the picture, causeways which dissolve, and horrible shifts in perception.

Some of the puzzles are quite easy and straightforward while others are tremendously tricky. After completion of a certain number a password is given so that the challenge can be taken up from there at the start of the next or any subsequent game.

If this all sounds quite interesting and subtly refreshing, all I can say is it could have been if it weren't for two two things. The first is that the time limit to complete a room is very tight. Even having watched the computer complete a room and then simply trying to replicate it in time is difficult enough. The terrible thing is that you are only graced with one life.

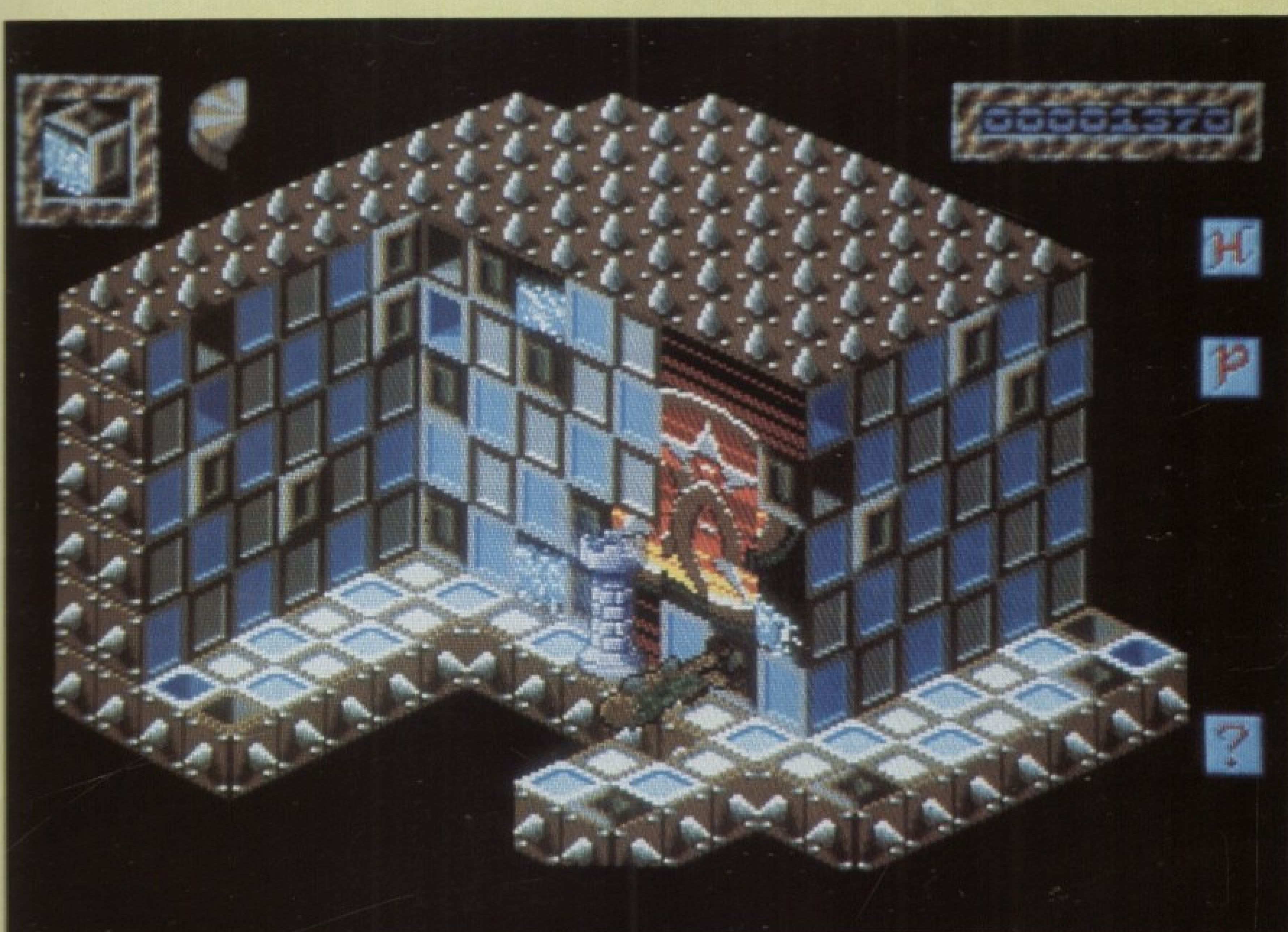
Well done Psyclapse, this isn't a case of shooting yourself in the foot, it's a case of blowing both feet right off.

Duncan Evans

Nevermind
£19.99
Psyclapse

Sound
Graphics
Gameplay
Value

Overall – 53%



This game can seriously disorientate your senses

STUNT CAR RACER

The chase is on

IMAGINE a race with only two cars, each as fast and powerful as the one Nigel Mansell drives at work, each with wheels like a tractor and suspension to match. Now put them on a track which is closer to a big dipper than Brands Hatch.

This is the flight of fantasy taken by Geoff Crammond. And while mere mortals would have to go back to daydreaming, he – the programming genius responsible for Aviator, Revs and Sentinel – has turned it into a reality.

The game was started at Firebird before it sold out to MicroProse. Geoff was given free rein to write whatever he wanted and take as much time as he liked. Not the usual contract. The results prove that the unusual pays.

Free from deadlines and the confines of an arcade conversion, Stunt Car Racer is the best driving game ever produced.

Controls are simple – if you aren't braking you are accelerating. Steering self-centres on the straight bits. The fire button provides a not too limited supply of boost and the dashboard shows if you are in the lead or have set the fastest lap. The distinctly dated speedo reads up to 250. Then it wraps around for higher speeds.

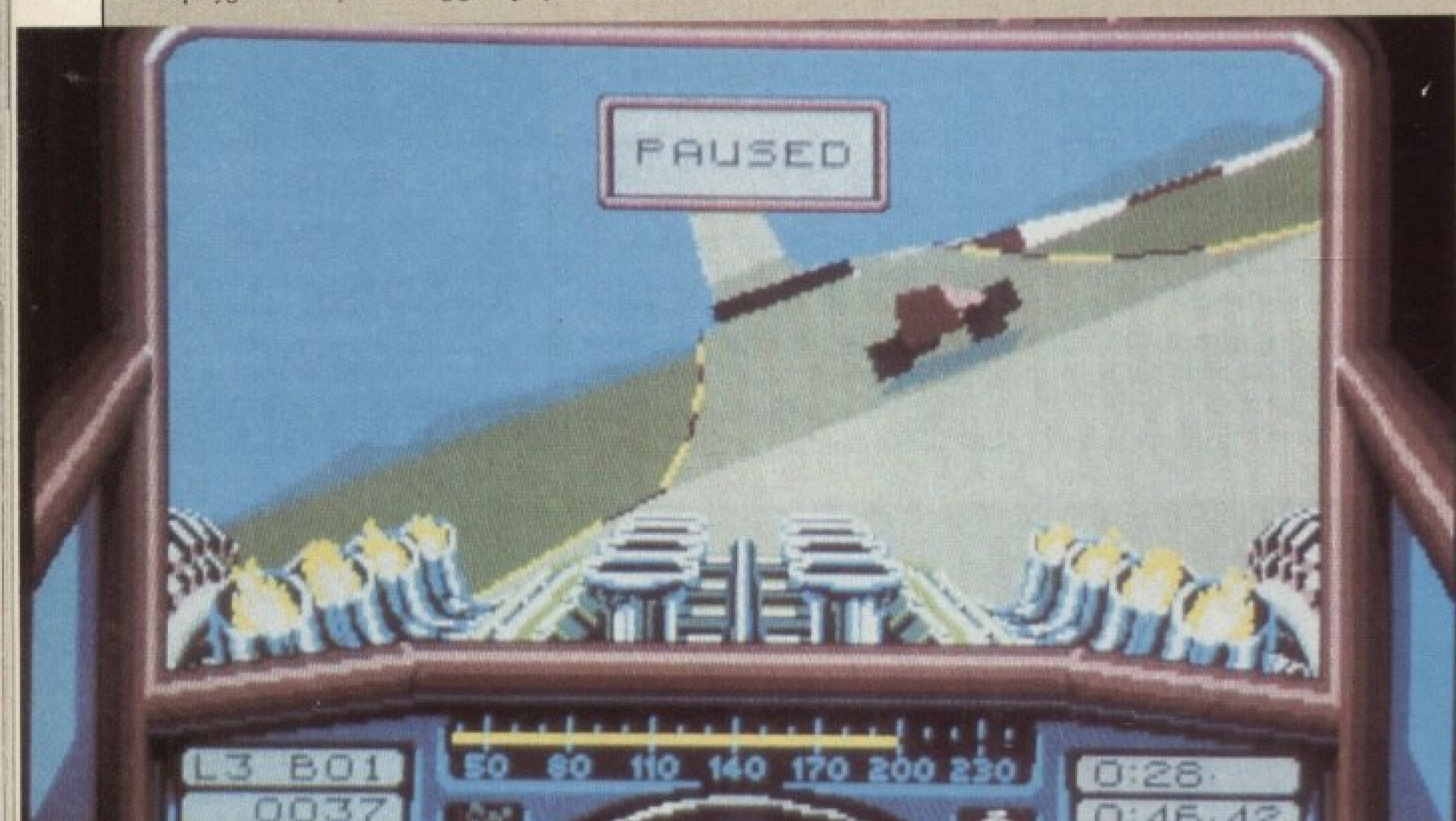
Minimalist controls leave you to worry about racing line. Not just corners, but how fast to go up the hills. Tear up a ramp, boost blazing, to find a corner just over the apex and you will be airborne without a track to land on. When pro racing drivers talk about "falling off", they don't mean this.

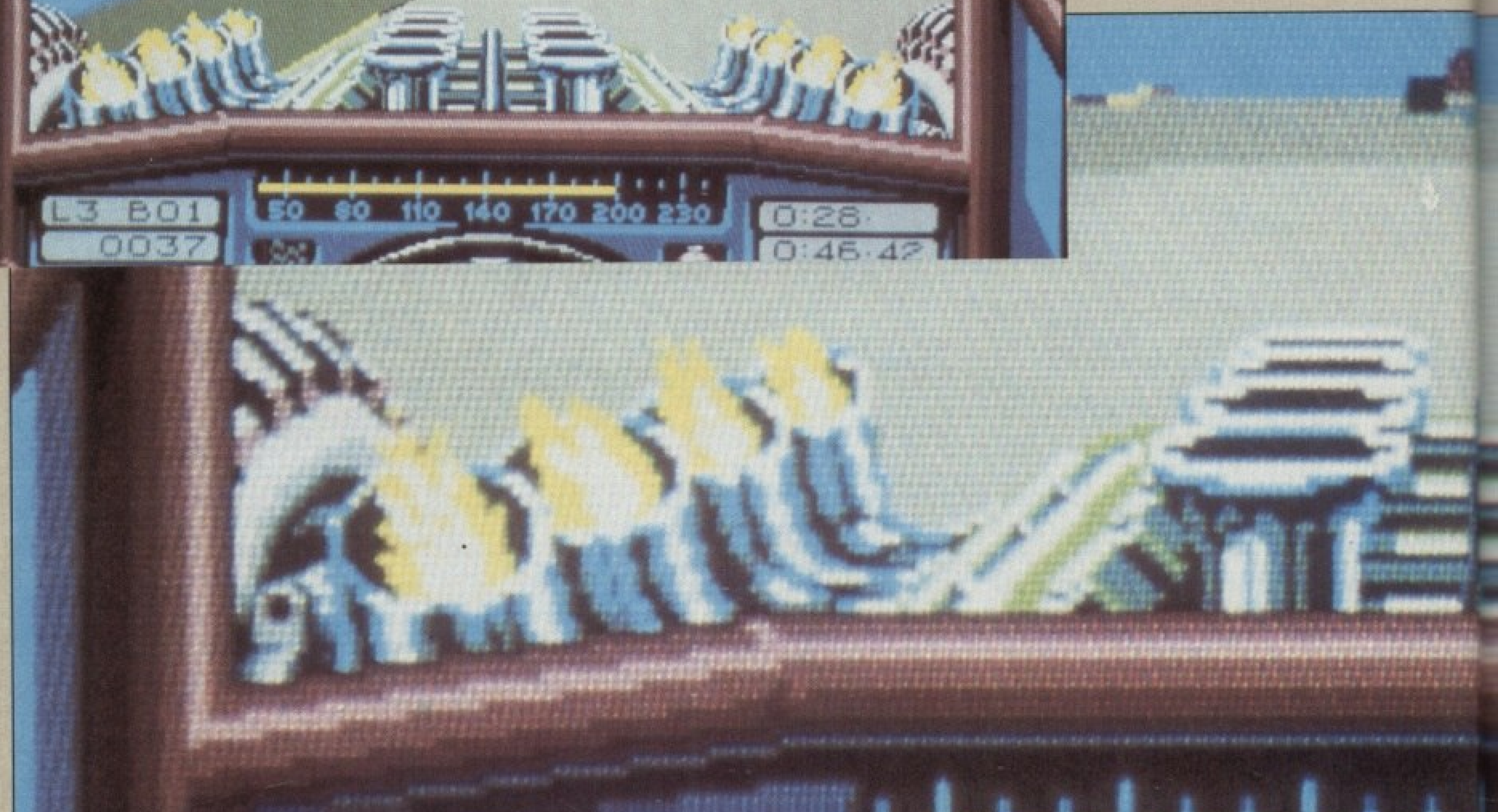
But leaving the track is part of the fun. There are jumps to negotiate where speed is critical. Too slow and you won't make it. Too fast and you'll land hard, wrecking the chassis.

Damage is shown as a crack which works its way across the top of the screen. Really hard bumps show up as holes which cannot be repaired between races. So it is very important not to fall off.

Keeping to the tarmac becomes less easy as the chassis damage starts to affect your handling. Enter too tight and you'll slide off the

Fast polygons make for exciting gameplay, even via the serial link





Watch your speed at the top of steep hills – too fast and it's wheeeee...

Supreme



Stunt cars are built to take the strain, but too much reckless driving can lose you the race

inside of a corner, too fast and you'll shoot off the edge.

The computer-driven opponent will help you off the circuit, although it seems to be impossible to knock the computer off. Single player races are conducted against a motley crew of nine other drivers. The aim is to win in each of the four leagues and make it to the top of class one.

You need to learn the tracks. My favourite is the Roller Coaster – curves tight as a tourniquet, slopes which make the Alps look flat. You can get up breakneck speeds, but make a mistake and the crane will have to hoist you back on to the track.

The game really comes into its own when you race against friends, either in a league, or ideally by using the two-computer datalink. Even linking a vanilla machine to the fastest Amiga you can buy works perfectly.

There are no pretty sprites or copperlist skies, just a few smart title screens between races and shots of the winner's podium. The whole thing is rounded off nicely by a comprehensive manual with a potted history of motor sport and some great action photos. No one could identify all the cars.

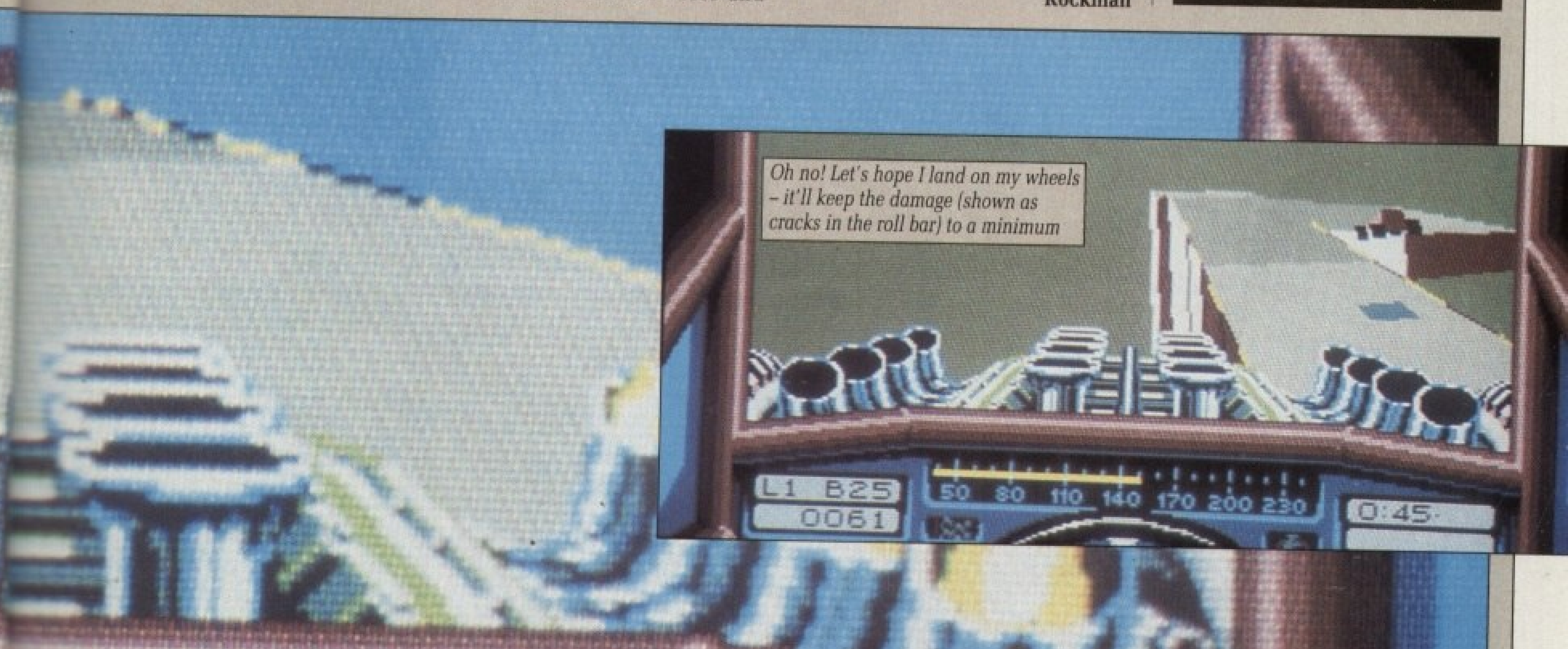
In future years, when most games have been forgotten and aged joystick jockies reminisce of the games of their youth, Stunt Car Racer will be one of the titles which gets cited as a true classic.

Rockman

Stunt Car Racer
£24.95
MicroStyle

Sound	
Graphics	
Gameplay	
Value	

Overall – 100%



Oh no! Let's hope I land on my wheels – it'll keep the damage (shown as cracks in the roll bar) to a minimum

TIME

Ticking away the moments...

YOU have seen the future, and it is not good. Not good at all. In fact, it's terrible. Everyone dies. Not very enjoyable. You've seen it because you've been there. In a time machine.

Confusing things, time machines. If you've seen the future, can you go back to the past and change it? If so, how could you have seen it in the first place? It doesn't exist any more. Or does it? I had that Robert Heinlein in the back of my cab once...

All these paradoxes are quite rightly swept aside by Empire Software, which uses the old adage "never let physics get in the way of a good story". The only snag is that if time travel did indeed exist as described, the entire fabric of the space-time continuum would be in a constant state of non-conservational energy flux, and not in a fixed newtonian frame of reference. But what the heck, it's only a game.

Time is an adventure spanning several thousand years of Earth history, from the era of the Roman Emperors to a period in the possible future when Earth has been ecologically destroyed. To avoid the main character constantly getting old and dying, a major plot device is that brilliant H.G.Wells invention, the time machine.

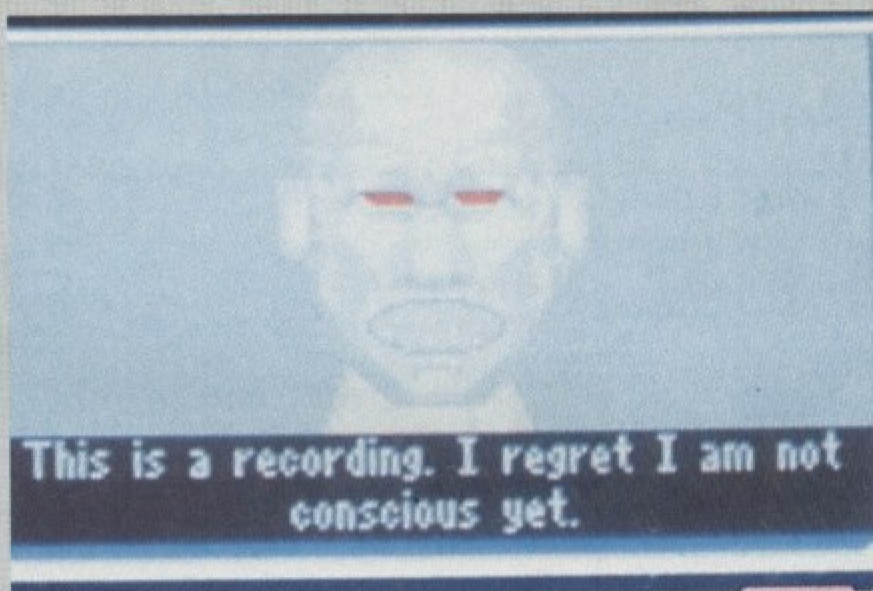
An approach normally kept locked into shoot-'em-ups is the multiple game scenario, all linked via some central theme. Occasionally ideas spill over into other game formats, and Time is quite happy to plagiarise from as many sources as possible to produce a potentially original plot, tying several small games together into one.

Our hero arrives on the orbiting satellite, Historsat, a giant floating library of Earth history. Finding out exactly what is going on involves solving some simple puzzles, such as chatting up a secretary, choking a cat and visiting what is left of Earth via shuttle craft.

Returning to the space station armed with a brief inkling of what is happening, the next task is to come to grips with is travelling into the past and meeting a few well known figures.

Each of these little adventurettes is a mini-quest in its own right, albeit of a rather simple nature. Mostly a case of walk over here, pick up this object and drop it over here, but they work well and are different enough to keep you waiting for the next.

The action is totally mouse-based, guiding the hero about a window of graphics and other characters. This window could most kindly be described as not large, but, believe it or not, it soon seems big enough. The majority of the screen is taken up by the action icons – the usual sort of stuff like drop, pick up and walk.



The friendly face of BT

The speak icon usually merits a response from the other characters, as they chatter away in an good animated sequence with their words appearing as subtitles beneath them. This provides lots of scope for doing some silly voices as you play the game.

Unfortunately you cannot specify what your hero says – he appears to be the strong silent type and waits for everyone else to volunteer information. This gives the game that slightly pre-destined feel which detracts from gameplay.

The puzzles in Time are not tough. I usually get frustrated with adventures when I can't solve a problem, and throw them away. I didn't throw Time away – it is a good re-introduction to adventuring for those of us who either gave up on the genre after The Hobbit or couldn't be bothered with incredibly complex solutions.

John Kennedy

Time
£24.99
Empire

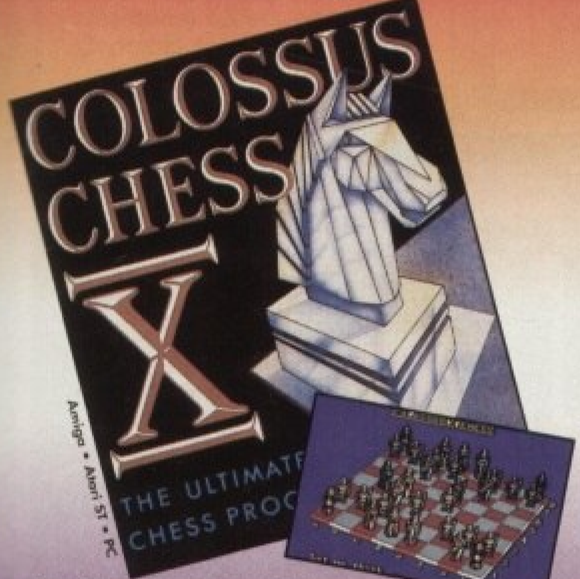
Sound
Graphics
Gameplay
Value

Overall – 78%



You though jet lag was bad

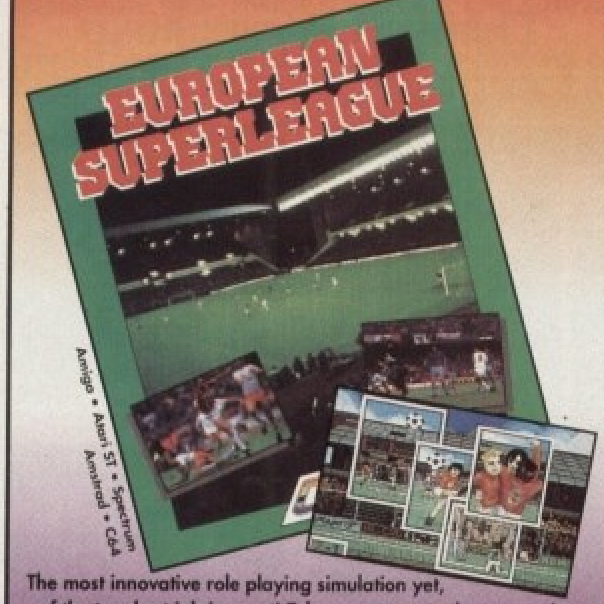
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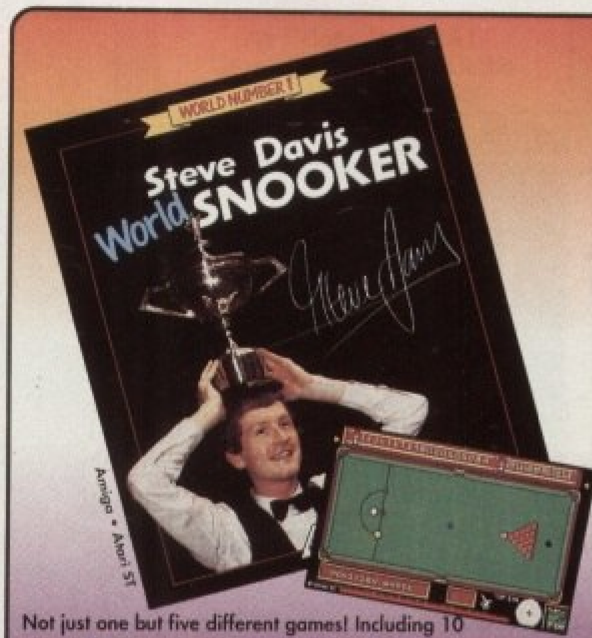
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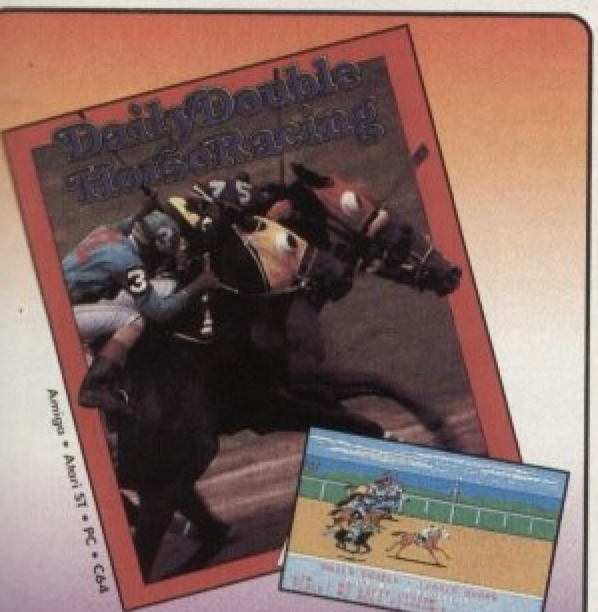


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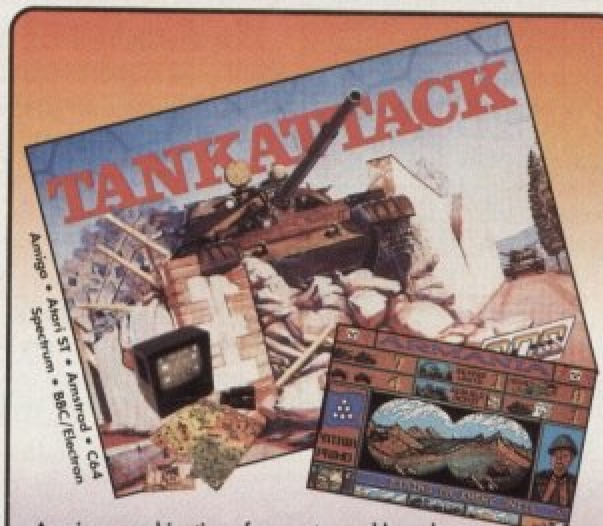


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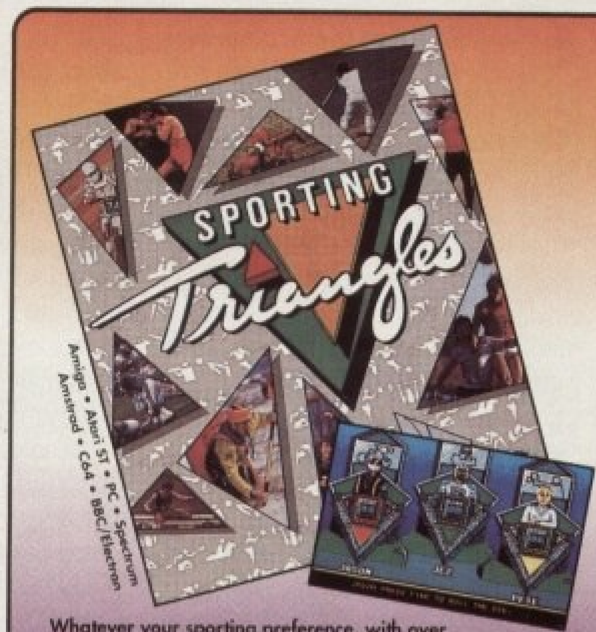
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A unique combination of computer and board game gives you the chance to command an armoured division.

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"An interesting, clever approach to the wargame concept with some well thought out game ideas, alot of fun to play" CRASH 80%

"CDS have managed to combine board and computer and produce a great game for everyone" Overall 85% COMPUTER GAMESWEEK



Amiga • Atari ST • PC • Spectrum
Amstrad • C64 • BBC/Electron

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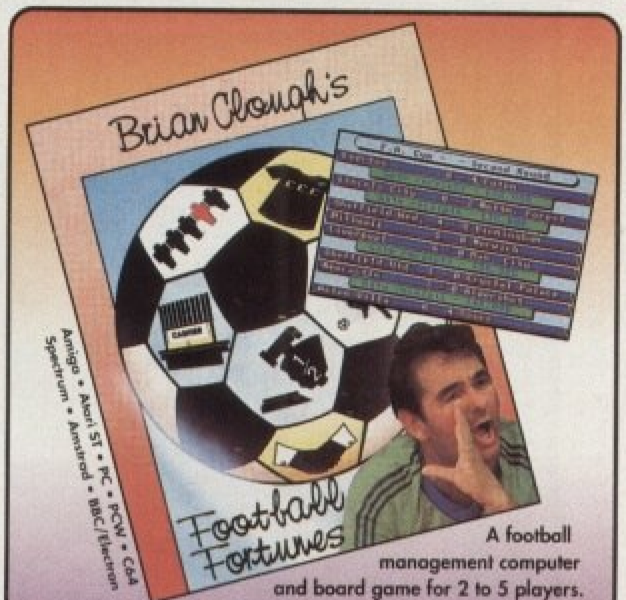


Amiga • Atari ST • PC

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Which one will you choose?

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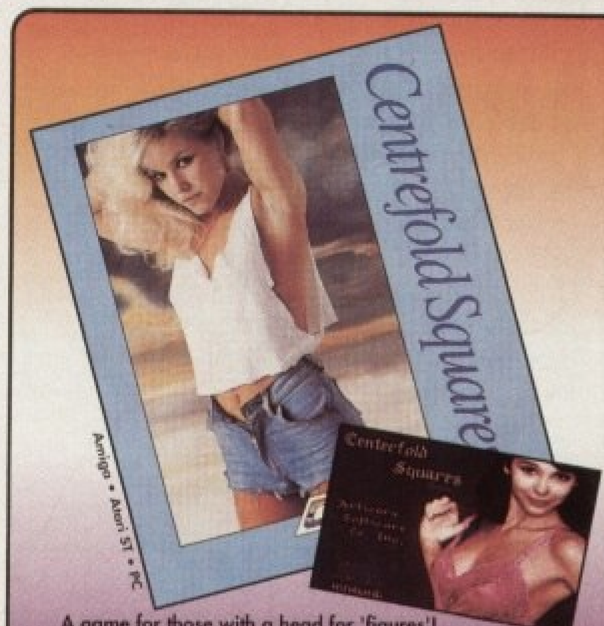


Amiga • Atari ST • PC • PCW • C64
Spectrum • Amstrad • BBC/Electron

A football management computer and board game for 2 to 5 players.

You must steer your team to League and Cup triumphs. Brian Clough's Football Fortunes combines an excellent range of computer based features with a fascinating high quality board game.

ZZAP! SIZZLER 93%
YOUR SINCLAIR MEGAGAME 9/10



Amiga • Atari ST • PC

A game for those with a head for 'figures'!

You are faced with a screen full of blank squares, but what delights lie hidden, just waiting for you.

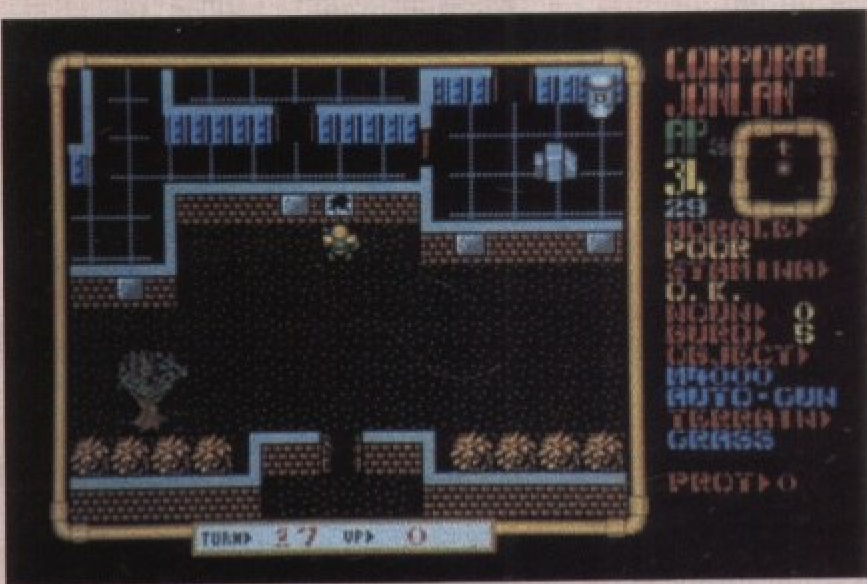
Pit you wits against your chosen Centrefold in an attempt to win each of the squares.

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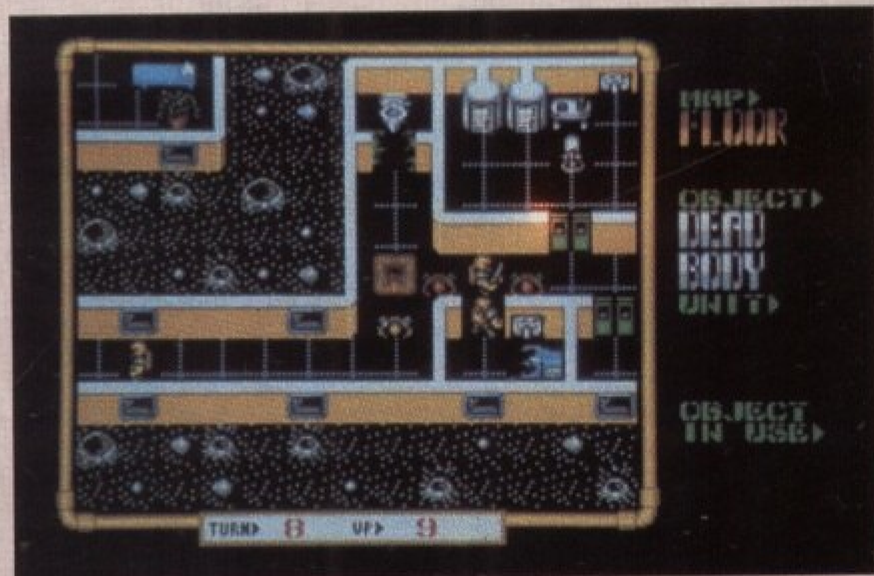
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LASER SQUAD

Their life is so cheap



She came in through the bathroom window



I think we've got a mole

CADETS for the armed services' Special Forces are hand picked from regular units. They undergo rigourous and extensive testing and training before they are given a permanent position. Only the very select go on to command such a cadre.

Until now, that is, because for a modest fee Laser Squad will put you in such a position. Just think, you're missing out on all that yomping through minefields armed with a forked stick, spending winter nights in the Cairngorms with only a Tesco carrier bag for shelter, climbing the Himalayas in your underclothes at night with a knapsack full of bricks, and so forth.

Even better, this is the elite service of the future, armed with all sorts of death-dealing weaponry from light sabres to heavy duty laser gear. Unfortunately, this of course means that the other guys have it too. Nobody said it was going to be lemon-squeezy.

There are five scenarios: An assasination attempt, an assault, a prison breakout, a defending action and a sort of forced march thing. This gives a fairly rounded sample of the sort of stuff these blackened-face and balaclava johnnies get up to.

The first thing to do before going on a very dangerous mission from which nobody is likely to return is to phone HQ and see if they haven't made some sort of administrative error. The second thing to do is to equip your men.

Since you are working for a band of rebels – born to be free, just like the fish in the sea – you are a bit short on the neccessaries. Typical, isn't it? I mean, just because making money out of the honest sweat of peasants is against their ideals doesn't mean that Rebel High Command can't bung something away in the Nationwide Anglia against a bit of serious weaponry.

Your team will consist of five or more members, some of whom are better than others at specific tasks. Unfortunately, you won't be able to find out what they are good at before the action starts, so you'll have to guess when you are equipping them.

Generally the corporals are better shots – except for Corporal Clegg, who has been excused from duty on account of his wooden leg – so give them the best weapons.

Another quibble is the deployment phase. Before the action starts you are allowed to choose where to deploy your men, but you aren't allowed to see the overhead map, so there is no way to plan your strategy. This might be all right if you are penetrating an enemy installation, but surely you would know your way around your own base?

There is an option to play against a friend or the computer. The computer can be programmed for varying degrees of skill depending on which scenario you have chosen. It gets tough at the top.

In terms of tactics, realism and the way your troops interact with each other and their equipment, Laser Squad is very true to life, although enjoyment is slightly limited by the small number of scenarios.

A good attempt to produce a role-playing game, combining graphics, gameplay and realism.

Lucinda Orr

Laser Squad
£19.95
Blade

Realism	■■■■■■■■■■■■□□
Strategy	■■■■■■■■■■■■□□
Gameplay	■■■■■■■■■■■■□□
Value	■■■■■■■■■■■□□□

Overall – 84%



Lost in time, lost in space

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- Easy access to joystick parts
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VISA

DARIUS+

There's plenty more fish in the sea



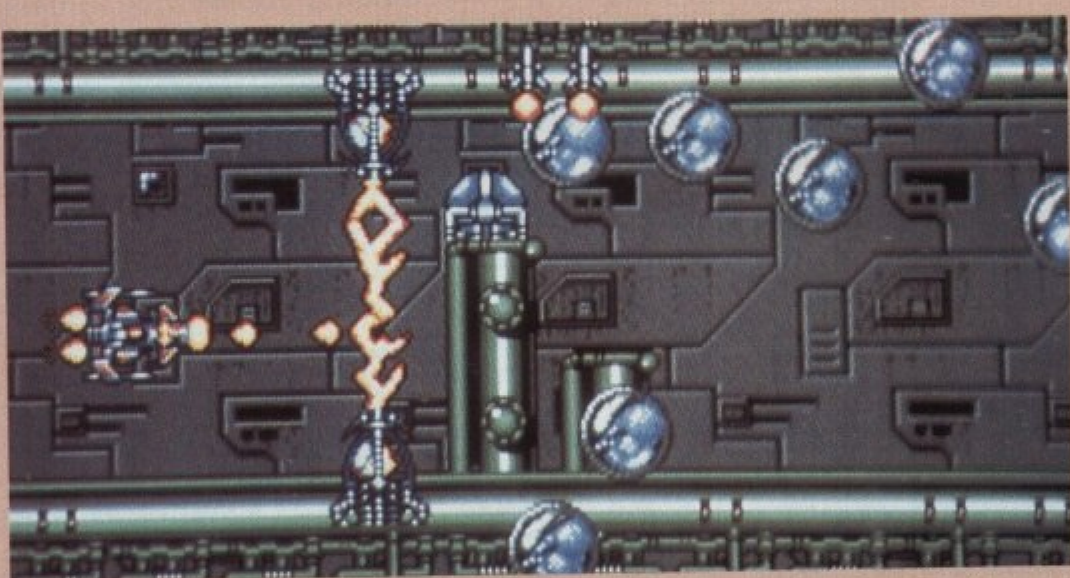
This bionic octopus is armed to the beak

SOME companies are renowned for their shoot-'em-ups. Some are admired for their graphics. Some companies are even celebrated because of the artwork they use on the packaging. Then there is The Edge.

To some people, The Edge's ability to produce a game which excels in all three departments mentioned above is akin to the ability of a small lettuce to write a dissertation on quantum physics.

Darius is a sideways scrolling shoot-'em-up that Taito produced in 1987. It performed quite modestly in the arcades and isn't really a household name. Darius+ is a conversion of that coin-op by The Edge, the plus sign signifying that the version running on your Amiga is significantly better than the arcade original.

Unfortunately for all concerned, it isn't. That's not to say that the game reaches the depths of certain of The Edge's recent releases, but



Your playing area is the thin strip between the horizontal green pipes

the artwork on the box depicting a submarine is an inadvertent give-away.

Half way through loading there is an intermission in which the person responsible for the music demonstrates his knowledge of samplers and arrangement. Then it is time to press the space bar and continue loading.

The game arrives with a serviceable fanfare, and in the blink of an eye the first of the 28 levels begins scrolling towards your ship from right to left.

The initial problem is one of firepower. The enemy has it, and you do not. A secondary problem is the size of the playing area. The screen has been reduced and the playing area is made even smaller by virtue of the scrolling scenery. A parallax effect is created by having a very dull blue background slowly moving by.

Pulsing stars put in periodic appearances and, if collected, add firepower to the current control centre. There is only one firepower centre to start with – your ship – but by collecting the other type of pulsing star, a droid and two cannons can be added and then upgraded.

Unfortunately there is a slight coordination problem here. Pressing F1-F4 signifies where the next power-up will have an effect, but there isn't that much spare time for keyboard pressing unless you have a joystick with sticky feet. Incidentally, an auto-fire joystick is essential.

Further key pressing is needed to send the droid out and about in true R-Type fashion. Another press on the spacebar recalls it, while fingering the left and right cursor keys will manoeuvre it behind and in front of your ship.

After a few practices, and probably a couple of lives, you will encounter the end-of-level fish, which loads in especially to fight you.

To defeat this mother of all fish it is necessary to eliminate its appendages one by one. Should you not possess the free swimming droid, which can be sent out to do just this job, then it is most likely that you will die. Should you have some other form of particularly virulent firepower, your chances improve to marginal.

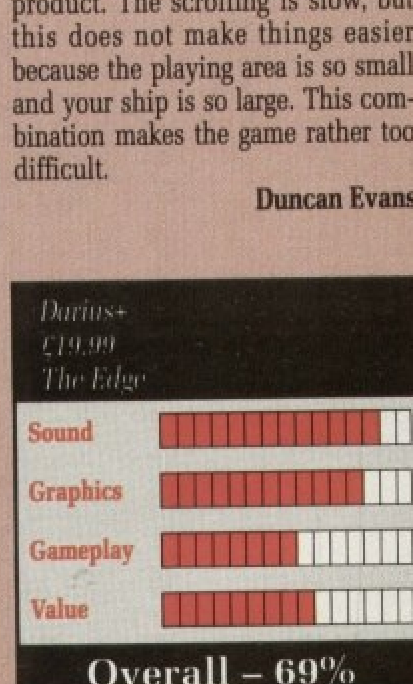
If and when the fish is removed, a branching network of choices spreads out in front of you. These are the remaining 27 levels.

Darius+ is an entirely adequate product. The scrolling is slow, but this does not make things easier because the playing area is so small and your ship is so large. This combination makes the game rather too difficult.

Duncan Evans



Gulp. Can't I have a saveloy instead?



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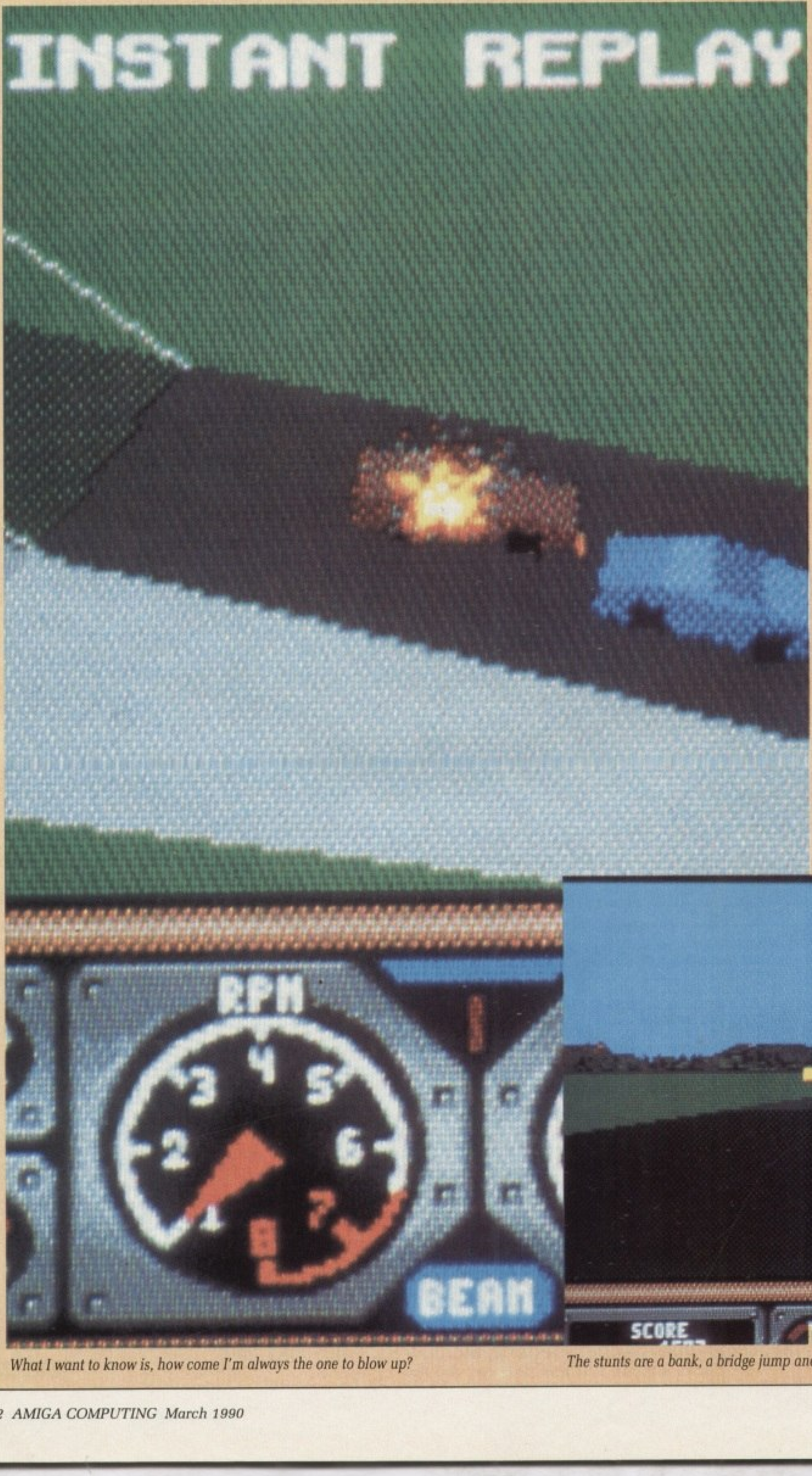
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VISA

HARD DRIVIN'

Life isn't this simple



What I want to know is, how come I'm always the one to blow up?

ONLY a few years ago a game such as this would have been impossible. A faithful conversion from the arcade game, Hard Drivin' is most definitely a car simulator, not your bog standard formula one racing car game. The arcade cabinet even had an ignition key.

Here you drive a red car of indefinable type with improved handling and tyres. It is sort of based on a Testarossa, but during the action replay sequence it looks like a breeze block with a brick on top.

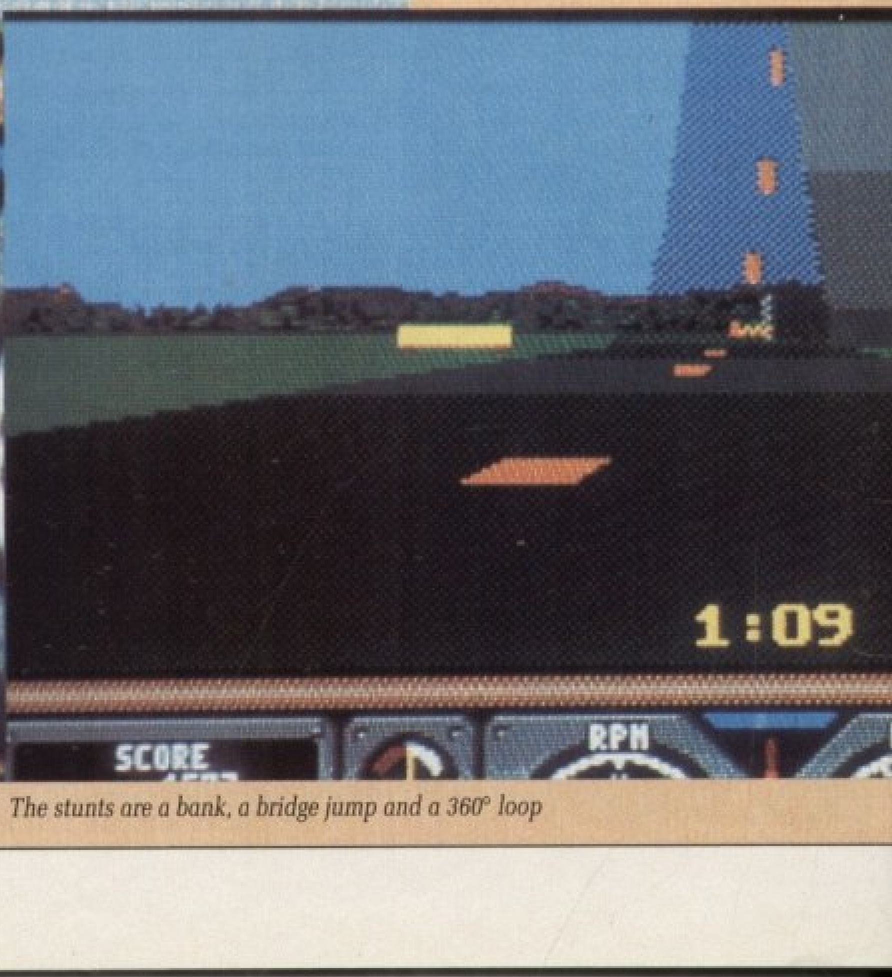
The track layout is designed to offer you a choice of straight speed or a stunt circuit with open bridge, 360 degree loop and banked corners.

When you skid, which you will do if you exceed 60 mph, you must point the wheels in the opposite direction to correct – and jolly realistic it feels, too. If you can resist shouting "Yeeeehaaa!" when you jump the bridge, then you are a stronger man than I.

Usual gripes about not having a steering wheel to plug into the Amiga apply, but using a mouse or even a trackball is a workable substitute.

A joystick can be used as a gear stick or as another steering implement, but it's not any easier to use than the dreaded rodent. Remind me to set up a company to sell steering wheels.

The mathematically generated



The stunts are a bank, a bridge jump and a 360° loop



Hard Drivin
£199.99
Tengen

Sound	
Graphics	
Gameplay	
Value	

Overall – 85%

Take my advice and keep to the left or the right

world in which you exist shows a few cracks here and there. Oncoming cars have a frightening habit of appearing to travel towards you through solid hills, and the action replay finds it difficult to keep up with the car travelling up slopes, and instead plants it under the surface. I was prepared to let these bugs pass (like the lorry on the loop-the-loop) because although annoying, they are not damning.

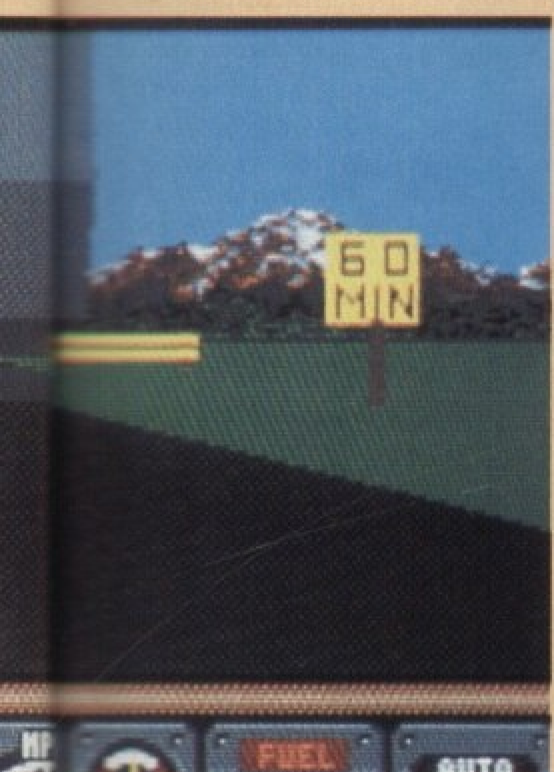
Unfortunately, there is a subtle moral dilemma in making car games as realistic as this. Striving to emulate the real world is to be recommended – it could be used to encourage skillful driving and potentially save lives. Instead you are encouraged in Hard Drivin' to break speed limits, drive on the wrong side of the road and infringe more road traffic laws than a typical cab driver.

A head-on collision with another car incurs nothing more than a time penalty. No multiple pile-ups and being forced to play the rest of the game in a wheelchair here. No, this is good clean family entertainment – killing people is OK as long as they are computer-generated people.

In a form of acknowledgement, the game gives you a helpful warning message to the effect that attempting the stunts in the game for real could be dangerous or even fatal. So make sure there is a grown up around when you try this, kids.

Solid, real-time 3D graphics have come of age on the home computer. The question is, are we ready for them?

John Kennedy



HELLRAISER

Snore



I SHALL now demonstrate two ways to be angry. The first involves having holiday leave cancelled. This usually creates a high dudgeon situation, but not quite of the same ire level as, say, the BBC deciding that your region isn't going to get Monty Python.

The real annoyance is that your holiday leave has been cancelled and instead you are off to off some Hellraisers.

Hellraisers are annoying creatures. All they ever seem to do is attack things and then fly off elsewhere to attack somewhere else. No one has ever got close enough to one to ask it why it's doing what it's doing. So whenever they appear, it's generally a case of "Let's do it to them before they do it to us".

By dint of some spectacularly unintelligent behaviour by a now deceased airlock attendant, the Hellraisers have got into the space fighter hangar and are raising the eponymous with all speed. To get to your fighter you have to trudge along some corridors, blasting any beasties you may meet, getting out of the way of the defence systems, which have got all confused.

Once in the fighter it's off on a somewhat dull sideways scroller (power pickups, yawn) with the inevitable showdown with something big and unpleasant at the end. Tell me something I don't know.

The other way to get angry is to actually buy this game. Now you know and I know that no game can be awful in its entirety. Hellraiser makes a darn good try at it – and very, very nearly succeeds.

The short and utterly pointless corridor section is only an exercise in losing a couple of lives so that you'll have even more time to wait for the game to reload. Each new stage takes ages to load and prints up an annoyingly obvious message. Yup, you guessed it – Loading...

Wow, even Mastertronic had that in 1984, complete with the three dots.

The only thing which is slightly good is the tune, which unfortunately fits in with the rest of game as a walrus would at a gerbil convention. The game can't even decide what it's called – the box says Hellraiser, the title screen says Liberator.

This game is too bad for words.

Stewart C. Russell

Hellraiser
£19.95
Exocet

Sound	
Graphics	
Gameplay	
Value	

Overall – 26%

WEIRD DREAMS

Close encounters of a sick mind

MICROPROSE has at last got around to releasing a Rainbird game that I first saw in back in June 1988. Weird Dreams is a collection of strange arcade games arranged to form an ongoing dream.

As we all know, dreams being what they are, the contents of them can jump from topic to topic or scene to scene in an instant, which is as good an excuse for sticking all these quite different games together as any. If anything this is the subconscious version of Summer Games.

Life in the dreamscape of Serrano, Hutchby and King, the co-designers, begins on the operating table – and it frequently ends there, before you, the patient, tumble into the first dream, a candyfloss machine.

Beware the giant floss stick which penetrates the sanctity of the tooth decay special. The candy whirls around and around, with the stick harvesting it relentlessly. The object here is to collect pieces of candy by standing up and letting them stick to you, and then jumping on to the stick the next time it comes around.

Needless to say this isn't easy, as it is necessary to spend most of the time crouched down to avoid being brained. As in all the worst dreams, your character stands up with all the speed of a sloth covered in treacle.

Once out of the candyfloss machine you find yourself at a funfair, one that is populated by a very large wasp. This is where the candy stuck to your chequered pyjamas comes in handy. Escaping from there to the hall of mirrors is easy, but now you have three choices of dreams to pursue in your bid to finish the game and wake up.

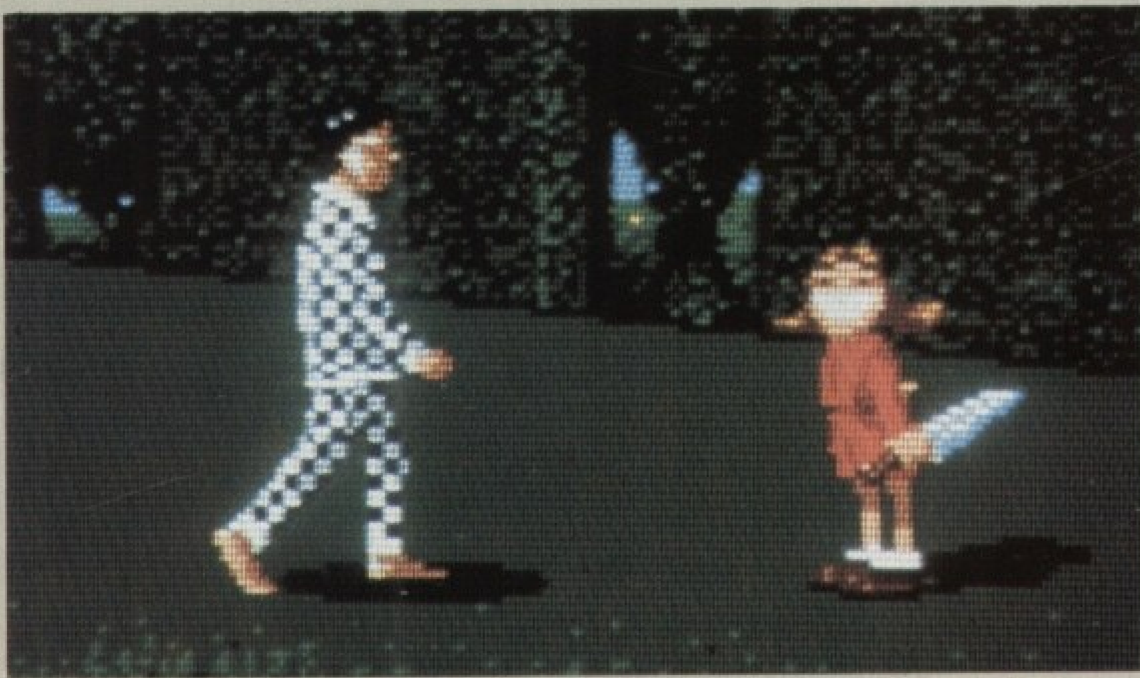
There are actually five mirrors but two of them are boarded up until you complete the other three. So, the choice is left, right or straight ahead?

Going straight on leads to another encounter with the candyfloss machine, while the other two choices lead to experiences in a desert and an English country garden, along with the music for it.

The desert is the strangest one. Overhead flies a flock of fish, one of which you must leap up and grab. Off you then go, and watch out for the amazing scrolling. In my dreams games always have ultra fast, super smooth parallax scrolling with planes of different resolutions gliding by. Unfortunately those sort of games tend to only exist in my dreams.

This game has amazing pause-o-flip scrolling. Reach the end of the screen and there's a pause for you to recover your breath, and then the next screen is scrolled totally in. Very impressive, I'm sure.

Anyway, you're plodding through this desert in your pyjamas waving a cod around when up pops the most horribly ugly thing you've ever seen, unless you've been to Brentwood and seen the people working on this magazine.



From candy floss machine to country garden...



Batter this guy with the cod a few times and he'll die. But there's more...

It's all springy legs, neck and head.

Whatever you think it is, whack it one with your cod before it springs at you. Of course there are lots of these things awaiting, but that's dreamland for you.

The garden scene has you picking up a stick and attempting to force your way past a bed of vicious red roses, which isn't too hard providing you stick at long range and thrust at them.

Weird Dreams may be a good deal more subtle than the Nightmare on Elm Street series of splatter feasts but there is quite a nasty surprise waiting if you take too long getting past the roses. Up from behind comes a very large lawnmower.

Past the roses and there's a sweet little girl waiting who wants to play ball. Unfortunately she also has a large knife. Get too close to the little urchin and...

A lot of Weird Dreams is quite unpleasant, but some things seem to have been cut out since I last saw the program. The screams when you get killed have gone, although they are still in the ST version apparently, and so has the end sequence when you lose all your lives and the surgeons leer horribly and lunge at you with a very large knife.

The music is disappointing on both the title page and during the game. A talented musician could have had a field day with the theme of frightening nightmares, but what we've ended up with lacks any feeling of menace at all.

The same could be said of the game itself. There are plenty of good ideas and classical dream elements in there, but it is all let down by dull graphics and bad programming.

Duncan Evans

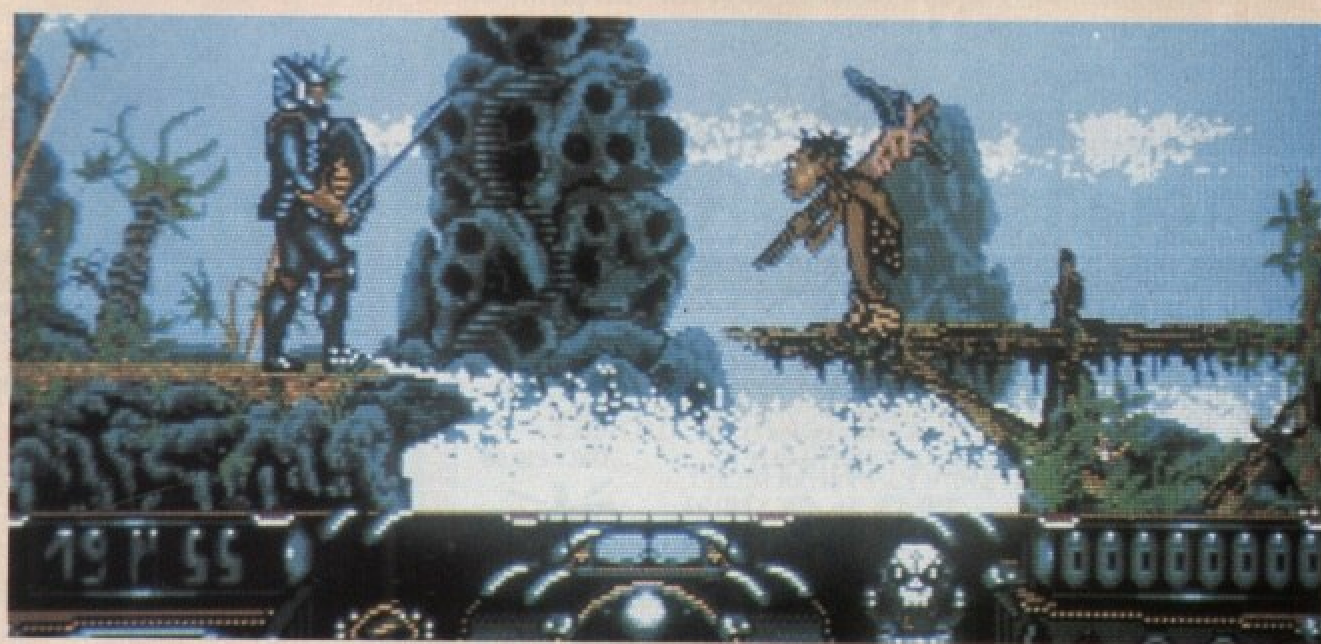
Weird Dreams
£24.95
Rainbird

Sound
Graphics
Gameplay
Value

Overall – 62%

KNIGHT FORCE

A chase through time



Watch out for the flying things!

OH DEAR, when everyone's releasing driving games left, right and centre, Titus goes for nostalgia and does a beat-'em- up. Always were a bit different, were the folks at Titus. Strange, even.

Strange is quite a good word for Knight Force, too, though it doesn't quite manage to convey the deep-seated bizarreness that pervades the whole affair.

The basic idea is that long, long ago – long before the dinosaurs appeared or Green last had a shave – there was a superior race of beings who knew the secret of time travel. These days, only BR knows the secret – when you want to travel, it always takes time...

As I was saying, before I was rudely interrupted, these zeebs could zip back and forth in time like a hot knife through butter, except they didn't need to be washed afterwards.

This kind of mellowed them out to such an extent that they only had one cat who had his head together enough to actually be any use, defence-wise. The Knight of Thunder was his name (he was always followed by The Morning of Rain) and he had one problem – an uptight square called Red Sabbath, possibly for copyright reasons.

This Red Sabbath character had kidnapped the Good King's daughter and had split his own persona into millions of individually-wrapped bits, partly to avoid detection and partly because it broke the ice at the Necromancers' Guild Tupperware Party.

You, as the Knight of Thunder, must get the King's daughter back. She's now the Queen because the old man died of acute embarrassment.



You rang, milady?

So off you plod, forward through time, past Pre-History with a suicidal Cro-Magnon man and a killer terrydac... pterodak... ptery... flying thing. Through Fantasy Land, with headbutting dwarfs, ninja skeletons and another flying thing. Along to Versaille in 1789, with murderous street urchins, hangmen, sewers and yet another flying thing.

New York's docklands await, with the girl gang leader, an octopus, and, yes, a flying thing. And finally to the Future, with all manner of technojunk and, quite surprisingly, two flying things. Nearly fell off my chair at the shock of it.

You've got to destroy a bit of Red Sabbath at each stage. This is rather difficult. He keeps moving about and won't stay still and die like a good necromancer should.

The only mild consolation is that when fighting Red Sabbath the constant barrage of flying things temporarily stops. But not for long.

Knight Force doesn't really hang together too well. The graphics would be OK on a C64, movement is far too intricate, the tune is way too odd, and trying to off Red Sabbath is like trying to go the wrong way through the crowd at the Shopper Show. All in all, it's another Titus game – good idea, bad implementation.

Stewart C. Russell

Knight Force
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Titus

Sound
Graphics
Gameplay
Value

Overall – 53%

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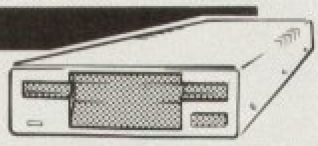


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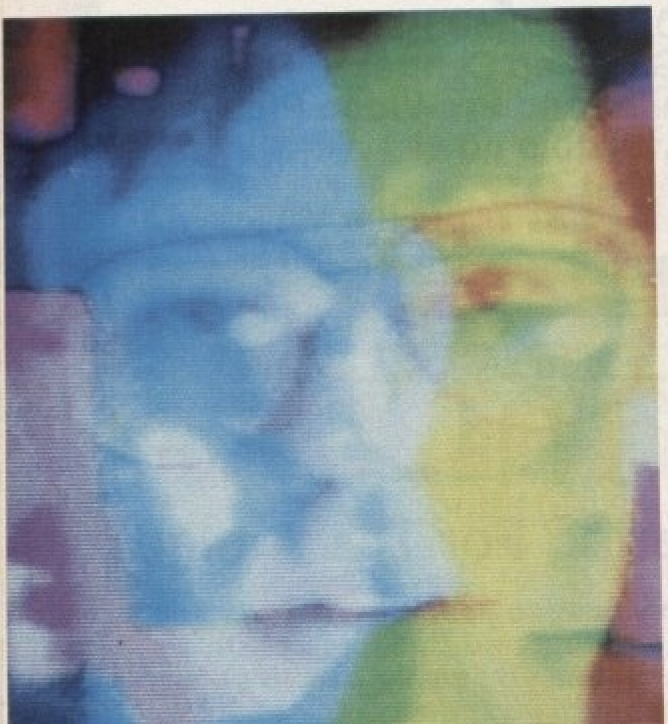
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Vidi goes colour



The best Amiga digitiser has had the technicolour treatment. John "AJ" Kennedy looks through the lens

YOU have a problem. You have a computer with amazing graphics capabilities but your artistic abilities are limited to drawing the curtains. Or you want to use realistic images in your latest homegrown arcade game. Or the robot you spent years building keeps walking into walls. Or – more likely – you have a deep and secret desire to draw



Black and white photos grab well

moustaches on famous people.

The answer to all these problems could be solved by one little box – Rombo's Vidi.

Physically, Vidi looks drab and worryingly like a DIY project. The small black box connects snugly to the parallel port and a trailing lead borrows a joystick socket to extract five volts.

Next to the phono socket where the video source plugs in sit twin twiddily knobs which control contrast and brightness. Brightness can be fine tuned under software control, but after an initial setting you rarely need to adjust anything again.

Vidi comes with a phono-to-phono lead, so if your video uses SCART or BNC connectors be prepared to be frustrated while you try to find a suitable lead. The camera I hired for this review necessitated half an hour's playing with paper clips (and a phone call to Green to look up SCART pin-outs) to jury rig a suitable connection.

If you have problems getting wired up, Rombo will be happy to talk to you about what you might need. On production of a very reasonable sum of money they will even give you what you require to connect Vidi to your whatever make of video recorder you have.

Frames are grabbed and stored sequentially in memory to form a sequence of consecutive images. The length of this sequence will obviously depend on the amount of ram you have to spare.

With a one meg machine you can store just over 20 frames. With eight megs you could store 278 screens, which may seem an enormous number but would only make about 12 seconds if played back in real time. One of the eternal computer truths –

➤

Frame grabbing works fast

DIGITISING a video signal is a complicated business. The signal consists of a series of consecutive frames, just like a piece of Super 8 cine film. Well, almost but not quite, because video frames are constructed in two parts or *fields*.

First all the even lines are sent and then all the odd lines. Each field consists of a control and timing section followed by a large block of analogue data to describe the brightness as it varies over the entire horizontal screen line. This data must be isolated and converted into the digital data which computers know and love.

The accuracy of the digital version depends on the number of brightness levels used and on the number of pixels used. The greater the accuracy required, the greater the complexity and expense of the hardware needed to digitise it. A standard digitiser combines several frames to extract as much information as possible, sometimes looking at the image slice by slice.

Obviously the subject being digitised must be rock steady during this process to avoid blurring. The pause button on most video recorders will not produce a perfectly still picture, so for best results the only answer is to use a rather expensive video camera.

A frame grabber is a digitiser which works hard and fast, capturing a single video frame and so avoiding any smearing caused by moving subjects. Vidi grabs single frames, but the pay-off is in the relatively low resolution of the output.

However, when animated or used with colour, the resolution is not as important as you might think, and VIDI has the distinct advantage that it can be used perfectly well with the moving image produced by a video recorder.



Green meets the Cheetah girl at the PC Show

➤ you never seem to have enough memory.

Special effects include the facility to grab into or around defined windows and so build up a vast moving scrapbook of video excerpts. Looks great, if not particularly useful. If you played your holiday video through it and dubbed some of Madonna's songs over it you might be able to pass if off as a cheap pop video.

Nevertheless it does demonstrate Vidi's ability to grab images into user defined screen areas – ideal if you need to size an image for insertion into a DTP package.

Although the supplied software offers facilities for reducing the number of colours in the grabbed picture and also for cutting and pasting, you will need a good art package to get the most from the digitised images.

In fact if you upgrade to a colour system you will need two art packages – one for the HAM colour pictures and one for the non-HAM monochrome images.

The software supplied is standard issue drop-down menus and ARP file requesters, which works well and feels robust. A palette editing section will automatically generate shades between two starting colours and give your monochrome pictures tones in purple, yellow, blue, or even sepia.

A nice touch is the ability to display all available frames in a photo-montage, ready for saving to disc either individually or in sequence.

Programmers will be pleased to note that a Library is available to access Vidi directly from your own assembler or Basic programs. With its high frame rate, Vidi is ideal for playing with image recognition and processing.

Vidi must be one of the most exciting peripherals you can buy for your Amiga. Now it is even more difficult to decide on expanding your machine, because you must decide on what you buy first: a memory expansion, a disc drive or Vidi.

REPORT CARD

Vidi
Rombo (0506) 414631
£114.95

EASE OF USE
Once connected to your video recorder you can grab all you see with no worries.

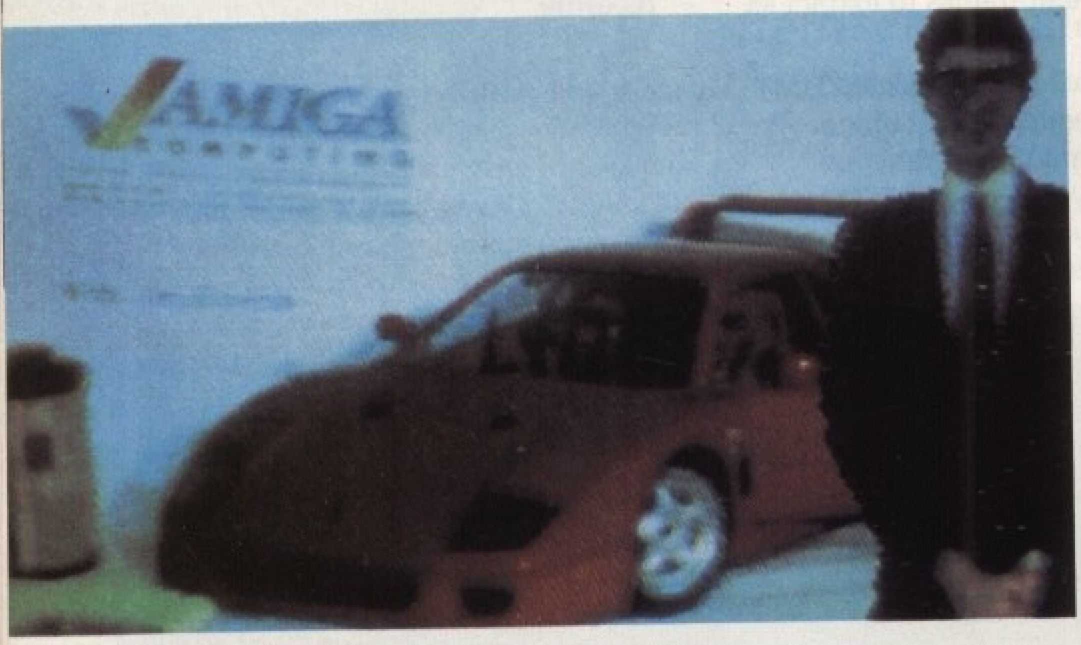
SOFTWARE
The software supplied works well.

SPEED
Very fast, but not quite quick enough to digitise juggling.

VALUE
Starts at £114.95 for a black and white unit, rises to £135 for a colour system. If you have a video camera, the colour option is worthwhile.

OVERALL *88%*

One of the great fun peripherals. The more ram you have, the better it gets.



Would you buy a car from this man?

X ray specs

DOWN to specifications - Vidi can capture a single video frame into its own internal ram with a resolution of 320 pixels by 256 lines in 16 shades.

Although images are grabbed in 1/50 of a second from a moving source, they can only be sent into the Amiga at around three frames a second. This is not Vidi's fault, more a consequence of using the parallel port to transport the image into the Amiga.

However, once frames are in memory they may be played back at any speed, the fastest being about 25 a second. To increase the display to its maximum rate there is a facility to stop the buffering and take one frame at a time.

Each frame is displayed as a four colour image, converted to 16 only when stopped. Useful for a photofinish of your Scalextric races.

If you are desperate to save money and are willing to sacrifice your PAL screen for a NTSC one, Rombo will sell you a cheaper Vidi for £99.95. It can be factory upgraded to a full PAL version, but the missing bottom of the screen is such a handicap that it is not worth the hassle of getting an NTSC version with a view to upgrading.

VIDI started life in black and white but is now capable of capturing colour images. This means buying a combined software and hardware upgrade for £ 19.95. The hardware consists of a set of red, green and blue filters and the software permits full-colour HAM images to be captured.

Software upgrades are promised to handle interlace with a resultant increase in picture quality. My version of the colour software tried, unsucessfully, to convert all frames to interlace by halving the resolution. The guru was only a minor irritation since any art package could satisfy this strange request.

By grabbing an image through each of a set of red, blue and green filters placed in front of the video camera, the amount of each primary colour in the picture can be calculated. These values are combined to determine the colour of the pixels in the finished picture.

Using filters mean that either colour or usually cheaper monochrome cameras can be used. The quality of monochrome cameras varies considerably; some are much better than others, so if possible try before you buy.

As the colour image is formed by combining three individual frames,



Subjects need to keep still when grabbed

Future enhancements

AS well as the colour upgrade, a colour separator and bus interface unit will be available soon. The separator will allow colour images to be grabbed without the need for filters by electronically separating the red, green and blue components.

This unit will interface automatically with Vidi or can be used manually with any other digitiser. It has the added benefit of allowing colour pictures to be grabbed from video sources other than cameras, such as a good video recorder.

The bus interface will solve the problems caused by using the Amiga parallel port and allow digitised images to be transferred to memory much faster.

Colour adds class . . . and the ability to capture pictures in 3D

this technique is only suitable for use with stationary subjects. Moving subjects produce weird multi-coloured effects as seen on Top of the Pops circa mid '70s, when long hair, silver platform soles and bad music were all the rage. Hasn't really changed much, I suppose.

Vidi produces colour results at least as good as I have obtained with other low price digitisers, with the benefit of having to get people to stand still for a few seconds rather than minutes.

Other digitisers require a return to the early days of photography with subjects standing still for uncomfortably long periods. If you are quick with the filters you can grab a HAM image with Vidi in about a second.

Colours were clearly defined - look at the *Amiga Computing* logo for the various rainbow shades. Skin tones also came out well, even Green's skin tones, which are different from those of everyone else.

The resolution was quite low when used with a fairly standard camcorder, making fine details hard to see. However, the results were still quite acceptable because with colour images detail is less important than form.

With a good monochrome camera, such as an Hitachi MV-720K, the results were superb. HAM mode is used exclusively by the colour software, and if you want to use the colour pictures in a non-HAM art package such as Deluxe Paint you will need some way of converting the images, an image editing program like Pixmate or Butcher.

There is an option to send images to a printer, but you will probably prefer to use your art package to gain greater control of the output. I was impressed with the colour option. Vidi seems to be more tolerant of lighting than other systems, producing good tones in all but the worst conditions. A nice trick when using colour filters is to capture pictures in 3D.

The subject is grabbed through one filter, the camera moved six centimetres to the left and grabbed through another filter. By controlling the colours in which the finished picture is displayed, the image will appear to have depth when viewed through coloured glasses.

This technique requires a lot of experimentation to get good results, but soon you could be remaking scenes for '50s horror films in glorious 3D-o-vision.



The colour filters work well

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		Member	R.R.P.
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Scrollys, wibbles 'n' things

Jolyon Ralph gives some tips on how to go about making a demonstration of yourself in exhibitions

SCROLLER, scrolly, scroll-text – call it what you will – every demo has one. None is complete without a message from the programmer telling you how brilliant he is, how long he took to program it and who all his friends are. The sillier the scroller is, the better it is. Usually. Some are totally daft; I saw one recently that tried to hypnotise you into sending off for a subscription to a computer magazine.

There are several ways to do these scrollys, and I've tried most of them. The easiest way is to use the blitter.

The general theory goes something like this. Follow this carefully, I'll type slowly for you: You define a bit of chip memory for your scroll to appear on. You set up your copper list so that this memory is shown as part of the screen display. Every frame (50th of a second) you scroll this bit of memory to the left a little, let's say by two or three pixels. Every three or four frames you will have scrolled the text enough to print another character at the right-hand side of the screen.

Now you get the next character out of your message string and check you haven't reached the end of your text. If you have, set your pointer back to the beginning of your text so everyone can read it a second time.

Take this character, which is an Ascii value, subtract 32 from it, multiply the result by the number of bytes per character in your font, and add this number to the start address of your font data. Now you have the start address of the character you want to print.

Now copy this data on to the screen in the correct position. For small fonts use the 68000, for larger fonts use the blitter.

CARRY on scrolling and adding the new characters when needed, and your scrolly is working. Now all you need to do is think up a really silly message. This is often regarded as the hardest part of programming a demo. It is best left to experts.

If you get stuck, throw in a stupid comment about an East European country that no one will ever understand. It makes your demos look intellectual without having to expend much needed brain power. It has always worked for me.

If you have followed all of this, you should be able to code a working scrolly. If you haven't, here are a few clues. You will need to call the scrolly routine once every frame from an interrupt, see last month's *Amiga Computing* for an interrupt driver routine that will do the business for you.

You may also be annoyed that your characters scroll off the left side of the screen smoothly, but appear one at a time splatted straight on to the right-hand side of the screen – not very smoothly at all.

You can fix this by splatting the character on to the bitmap off-screen. If you have a bitplane-modulo set for your screen, you can specify a certain number of bytes skipped at the end of each line on the screen which are not displayed.

If you set this modulo to two, your effective bitplane width is now 42 byes wide, although only the first 40 are displayed. If you print your new character in the last two bytes, you will not see the character being splatted on the screen; it will appear to scroll perfectly smoothly.

There's a rather nice scrolly routine – even if I say so myself – in the source code for my Christmas Demo on the January cover disc. This uses a 32-pixel wide multi-colour font and employs all the tricks I described above. If you haven't got it, buy yourself a back issue now!

The only other problem is getting hold of a font. You can, of course, use the one that I created myself, which is on the September cover disc. This is a 16 x 16 font, but the principle behind the whole business is the same for any size.

Another justly famous demo technique is the wibble. This involves displaying a picture and sort of wobbling it a bit, but wobbling each line of the picture differently. Sounds strange, and it is.

An example of this effect can be found in the Heavy Demo on the November cover disc. The overall effect is somewhere in between looking like the picture is melting and the picture is being drowned in thick oil.

I did this to the *Amiga Computing* logo at the bottom of the Heavy Demo – and a very nice logo it was too.

This wibble effect is caused by changing the horizontal smooth- scroll register ($dff102) each line in the copper list. This allows each line to be offset by up to 15 pixels. One other useful application of this is to change a scrolly from an ordinary font (boring) to an italic font (yippee, really exciting).

If you add the following lines to ➤

➤
your copper list:

```
dc.w $a009,$fffe,$102,$88
dc.w $a109,$fffe,$102,$77
dc.w $a209,$fffe,$102,$66
```

and so on, up until:

```
dc.w $a709,$fffe,$102,$00
```

and set up your bitplanes so your 8-pixel high scroller is displayed between scanlines $a0 and $a7, you will find that you have an italic scroller instead of a normal one and you will gain new friends when everybody sees how clever you are.

Back to the point for a little while, the amazing and astounding wibble effect. If you display a picture on-screen and have a simply massive amount of copper list much the same as the small listing above, you can make a rather ordinary looking picture look very weird.

The best way to do this is to calculate the wibble from a precalculated data table of sine values, that is, a list of values from $0 to $f and back to $0 again which follows some vague sine pattern.

Such a list would look something like this:

```
sinelist:
 dc.b $0,$0,$0,$1,$1,$1,$1,$2,$2,$2
 dc.b $3,$3,$3,$4,$4,$5,$5,$6,$6
 dc.b $7,$8,$9,$9,$a,$a,$b,$b,$c,$c
 dc.b $c,$d,$d,$d,$e,$e,$e,$e,$f
 dc.b $f,$f,$f,$f,$f,$e,$e,$e,$e
 dc.b $d,$d,$d,$c,$c,$c,$b,$b,$a,$a
 dc.b $9,$9,$8,$7,$6,$6,$5,$5,$4,$4
 dc.b $3,$3,$2,$2,$2,$1,$1,$1,$1
 dc.b $0,$0,$0
```

Don't use the above list for any important sine calculations, because I didn't calculate it, I made it up as I went along. But rest assured, it will look fine for the kind of effects I'm talking about.

So, you set up your copper list full of these *$102,xx* commands, and then you move them with an interrupt routine. Scroll the values up a bit so that:

```
$a009,$fffe,$102,$44
$a109,$fffe,$102,$55
$a209,$fffe,$102,$55
```

becomes:

```
$a009,$fffe,$102,$55
$a109,$fffe,$102,$55
$a209,$fffe,$102,$66
```

Put the next value from the list on the bottom line and keep on scrolling. Your picture will now wibble! This effect looks especially good on digitised photos, especially of people you don't like.

Well, these are two fairly simple examples of how to use the hardware to create graphical effects. All the other effects you see in demos are produced in a similar way, they just take a little longer. For example, I could explain to you how to produce 3D vectors if I had 16 pages spare and a better grade in my A level maths.

The best thing to do is to load up a demo, look at it closely for a few minutes and think to yourself: "How do they do that?" Most of the time the best looking effects are done with the simplest pieces of code. And if that fails, you can always cheat – disassemble the demo and see what they're doing.

NOW a final bit of advice. Several people have asked me what you actually need in the way of software and books to program the Amiga. With software you only need to buy a decent assembler – of which there are two: Devpac and ArgAsm – and possibly a paint program, which will be Deluxe Paint II or, preferably, Deluxe Paint III.

Digi-Paint, Photon Paint and other HAM paint programs are not much use to demo programmers because HAM screens are not much fun to play around with.

The rest of the software is more or less free. IFFconverter converts IFF files to raw data which you can load straight into your demos. This was on the October cover disc. Fnt2Raw is a useful little utility that converts IFF font files into raw data for use in scrollys, a little gem that can be found in most good public domain libraries.

The first book you will need is a 68000 programming book, unless you are a natural expert at 68000, and I've not met many of them. Various books are available and all seem fairly good. Try to borrow a few from a library and buy the one you like the most. They all have a different style and cover things in a different order; everyone I know has their own personal preference.

You have a choice of two for your essential Amiga hardware guide. Up until a couple of weeks ago I would have recommended everyone to buy the System Programmers Guide from Abacus, but now the new Commodore Hardware Reference Manual is available, and is at least 9.6 times better than the old one.

Buy this if you can – it's cheaper than the Abacus book – but get the new release with the blue cover, not the old red and white one.

Of course, the old Hardware Reference Manual is a classic, and I just happen to have one for sale second hand...

● *NEXT MONTH: Nothing. This is the end.*

Playing with the ECS

HAVE you got one of the new Amigas with the Enhanced Blitter? If you do, and you also use a monitor, then you can benefit from an amazing feature of this chip, the 60Hz mode.

This works in the same way as the 60Hz mode on the ST. It makes the machine run in the American NTSC video standard instead of the European PAL standard (thus this trick will not work on PAL televisions, only on monitors).

The advantage of this is that it will stretch the NTSC screen to fill the whole monitor. Games written for NTSC screens, which usually have a black border at the bottom of PAL screens, suddenly fill up the whole screen. Interceptor, for example, is amazing in 60Hz mode.

All you have to do is write a simple two line program in assembly language:

```
move.w #0,$dff1dc
rts
```

Assemble this to a file called 60Hz. Put it in the startup-sequence of programs you wish to run in 60Hz mode. To turn back to 50Hz, use this code:

```
move.w #32,$dff1dc
rts
```

The credit for discovering this gem must go to my good friend Alex Slater, who came across it accidentally when his sprite routine blew up.

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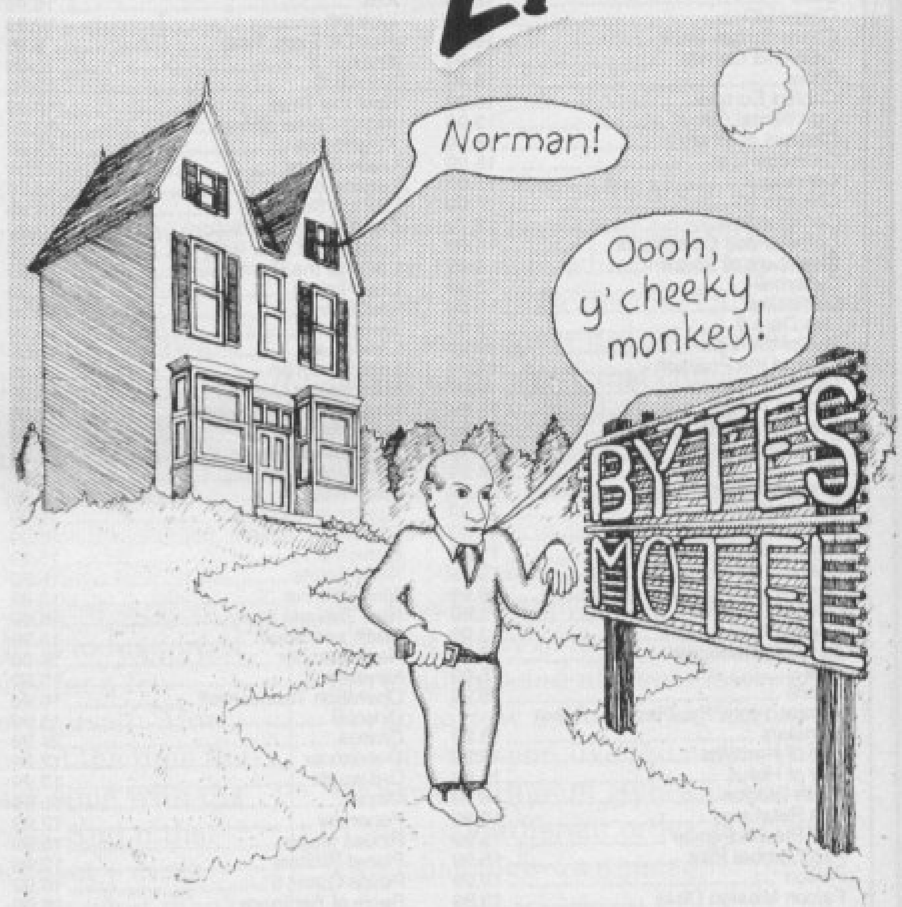
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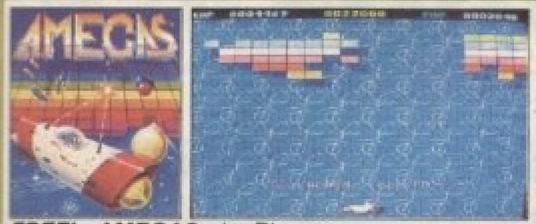
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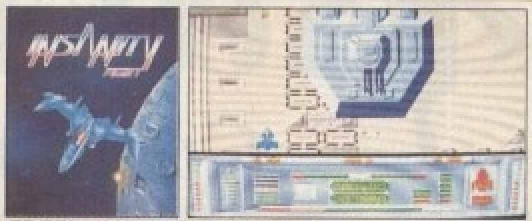
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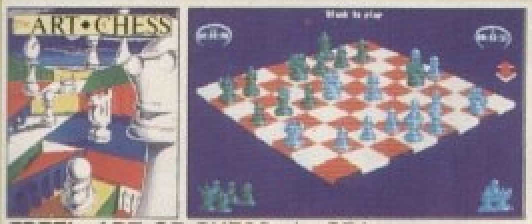
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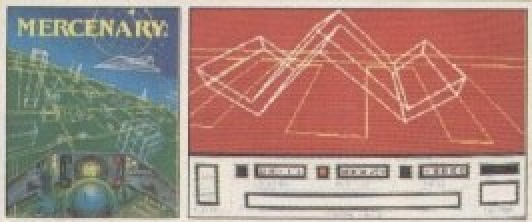
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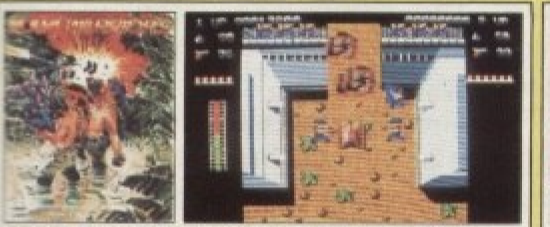
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Of mice and men

The staff of Amiga Computing conducts a long term test on the very latest replacement Amiga mice

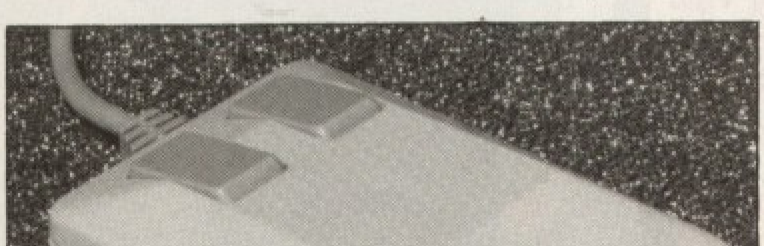
THE bog standard Amiga mouse has gone through a number of revisions since 1985. It's made as inexpensively as possible to keep the cost of the Amiga package down. And if you use your Amiga for business, as we do, the odds are it won't last longer than a few months.

We've been through five Commodore mice in 12 months. All of them died of worn out bubble switches – that's the bit under the button that clicks when you press it.

A good question to ask when buying a replacement mouse is: "Does it have bubble switches?

The "Where am I?" mechanism is opto-mechanical; the ball moves some rollers which spin a slotted wheel. A photocell inside the mouse counts the slots moving past a light and can work out the speed up and down the mat. Another similar set-up at 90 degrees to this works out the speed across the mat. The two figures are then sent back to the computer.

The rate of counting determines the accuracy of the mouse, but too high a rate will show up any imperfections in the mechanical parts. The Commodore mouse has a resolution of 200 dots per inch.



Commodore mouse

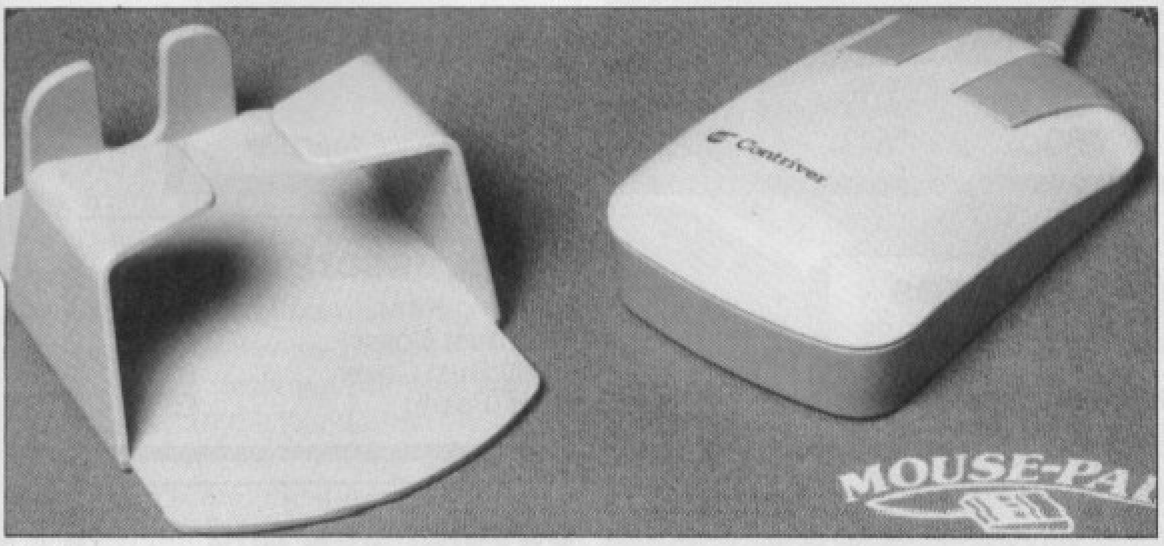
If your Amiga mouse breaks and you feel that you must buy an original Commodore replacement, you'll probably have to order one from your local dealer. A browse through the mail order companies plying their wares in *Amiga Computing* did not reveal anyone who stocked it.

Commodore Business Machines (UK) Ltd, Commodore House, The Switchback, Gardner Road, Maidenhead, SL6 7XA. Tel: 0628 770088. £34.95

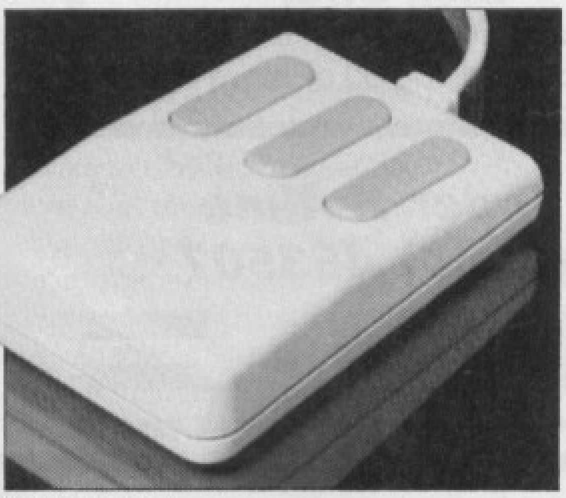
Contriver Mice

CONTRIVER (Europe) Ltd makes two inexpensive replacement Amiga mice, the C820-G-A1 and the C830-G-A1. Mechanically the same, the 830 being the later model. Differences are wholly cosmetic – the 820 is rounded with beige buttons; the 830 is a squarer shape with black buttons.

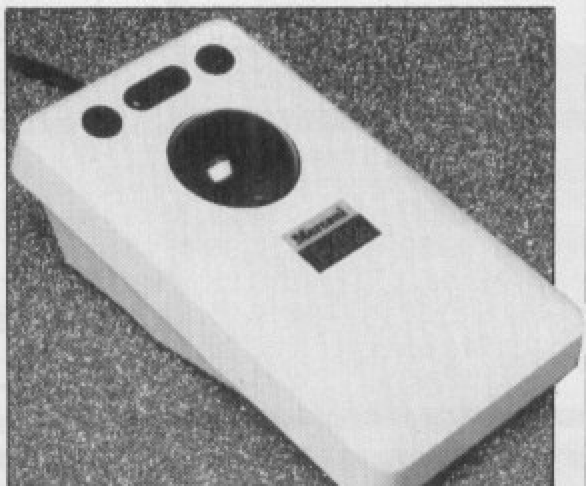
Inside the gubbins are similar to the Commodore mouse, but with more robust bubble switches and a clever mechanism which lets you easily remove and clean the brass rollers.



Contriver mouse



Boing! mouse



Marconi trackerball

After two month's heavy use at home and in the *Amiga Computing* office, both mice – or mouses, as Contriver prefers to call them – are still going strong and feel as though they have a lot more mileage in them yet. Both come with small but adequate mouse mats and plastic stick-'em-up holsters.

Like the Commodore unit they have a 200 dpi resolution but are better made and cheaper.

Contriver (Europe) Ltd, Unit 3 Buckingham Industrial Estate, Buckingham.
Tel: 0280 822803. £29.95

Marconi Trackball

AN angled cream box, the trackball is just smaller than an A590 hard disc and a matching beige colour. It plugs directly into the mouse socket. No driving software required.

The lower half on the top surface forms a rest for the base of your hand, allowing your fingers and thumb to easily manipulate the snooker sized ball.

A slight finger stretch away are three buttons, two of which are the same as the buttons on a standard mouse. The third does nothing special unless your software is specially programmed to respond to it.

Rolling the ball fast makes a definite noise. This annoyed people in the office until Green's monitor started making a high pitched whine to drown it out.

Freehand drawing is tricky. Most art packages need you to hold a button down to draw, so you will have to use a finger to hold down a button and twiddle the ball at the same time. You can't use the palm of your hand on the ball because the switches are too close.

On a soft mouse mat, the very act of pressing a button causes the pointer to drift slightly as the mouse is pressed into the surface. This problem does not occur with the trackball.

Games playing is an interesting experience. It's good for Missile Command and Centipede clones, and surprisingly good for some car games. Unlike the mouse, you never run out of desk space and lose a life because you aren't able to move your rocket, hero or cute furry animal any further left.

Using a trackball is perfect if you do a lot of programming and rarely need to use the mouse. Instead of hunting for the hibernating rodent under sheafs of paper, or following a flex tail to its conclusion, just roll that ball and resize the windows.

For about a week I found I was constantly reaching out for the non-existent mouse. This soon passed, and now I'm about 98 per cent accurate, only occasionally missing the odd close gadget. Trackballs are a breed apart from mice, and take getting used to. But once you do, you'll never miss the tiny rodent.

RB2 Trackball, Marconi Electronic Devices Ltd, Carholme Rd, Lincon LN1 1SG.
Tel: 0522 510500. £59.95.

Boing! mouse

WHO would think of a mouse as a status symbol? You can't buy them in Harrods. There is one mouse which has all the techie street cred of an eight megabyte expansion. The Boing! mouse.

Made especially by Mouse Systems for Dale Luck, the ex-Amiga programmer and owner of Boing! Inc, it looks the same as the mice on mega-expensive Sun workstations.

Dale commissioned them for use with his X-windows software, which turns the Amiga into a workstation because it needs three buttons. AmigaDos has the routines to use the third button but suitably equipped mice are such rare breed no programs use them.

There are no moving parts other than the microswitch buttons. It works by shining a light on to the special gridded mousemat and counting the reflections using two photodiodes. This restricts you to using the supplied mat and it takes some getting used to because the mouse must be kept parallel to the mat.

However the result is very accurate at 300 dpi and the felt pads on mirrored mat give a smooth action. Simon has used his for six months and the only glitch was when he spilled coffee on the mat. The pads on the mouse soaked this up and the whole thing had to be left to dry. An hour and a squirt of Windowlene later everything was fine. The Boing! is more than just a good pose, it's a great mouse, albeit overpriced.

Boing! Mouse, Amiga Centre Scotland, 4 Hart Street Lane, Edinburgh EH1 3RN.
Tel: 031 557 4242. £79.95.

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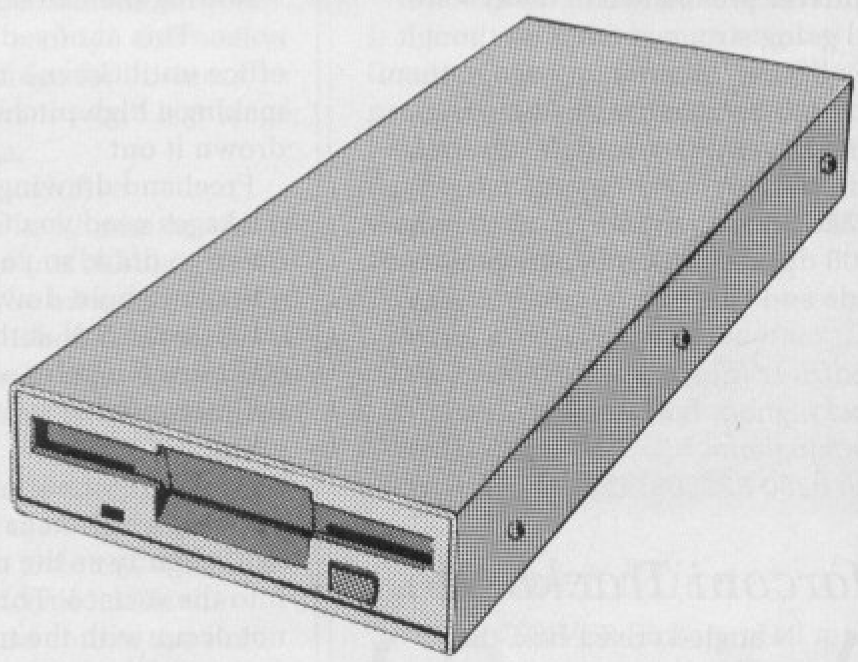
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Naksha

SAD as it may be when your little friend and companion through hours of Amiga enjoyment finally goes buttons down, there is always the expectation that now you can splash out on some hi-tech ergonomically designed pointing aid.

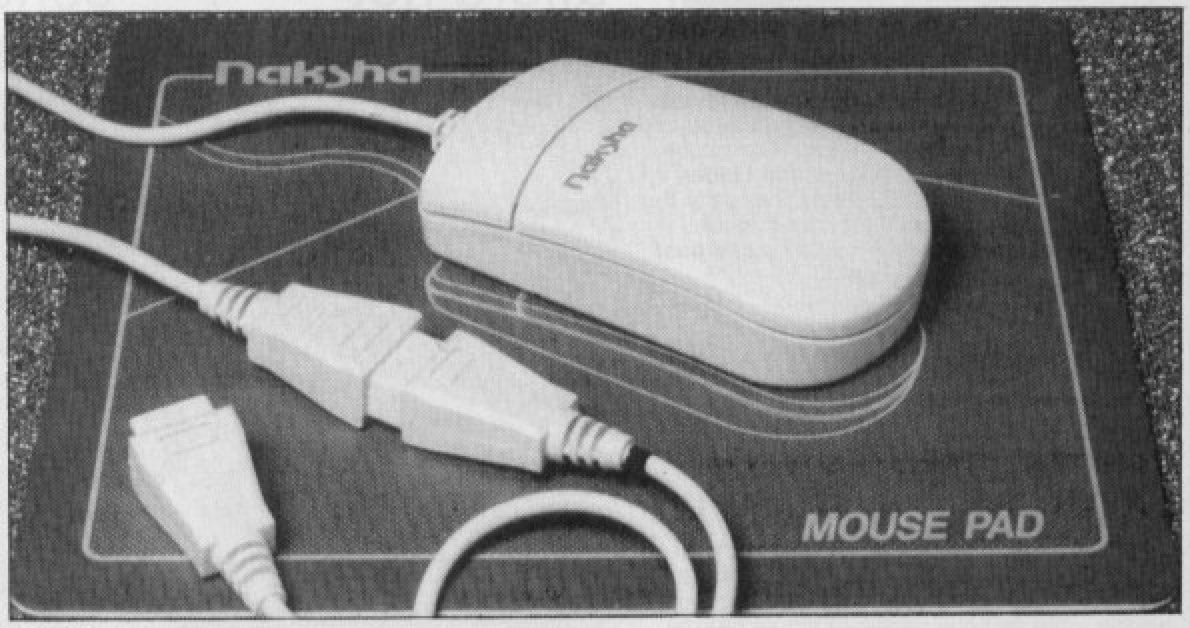
In contrast to the Commodore supplied variety, the Naksha mouse offers more economic dimensions and a sense of nimbleness enhanced by it's higher resolution 280 dpi.

Two overlarge buttons inhabit the forward area of the curvy case which then rises in a pregnant palm-filling hump.

Nice to handle, free and easy to move, but then they all seem that way when you get used to them. State of the art opto-mechanics and microswitches virtually guarantee long and trouble-free service. The leads which let you plug it into an Amstrad or Atari are a gimmick.

The best presented of all the mice, the Naksha comes with an excellent steel-centred mat.

Naksha replacement mouse, Naksha UK Ltd, 29 The Warf, Warrington, WA1 2HT £39.95.



Naksha mouse



Gravis mouse

Mousestick

CONTRARY to what some of the sensationalist press may be saying, the Gravis Mousestick is not a toy.

Yes it is a joystick which works like a mouse. Yes, you can play mouse-control games with it. Yes, it is good for flight sims. No, that is not what it was designed for.

The Mousestick is a direct replacement for the mouse. Although most people who have graduated on to the Amiga have learnt to use the mouse and may feel the action of the Mousestick to be alien, still some people feel more at home with a joystick – it is a question of personal taste.

With its programmable resolution up to 1200 lines from one end of stick travel to the other it can easily be more accurate and controllable for CAD and other design work. The programming is done via a small unit which is connected between the stick and the Amiga.

You may also program response modes, X and Y trims and virtually anything else you can imagine. You can store up to four setups.

The Mousestick is based around the design of the Gravis Joystick, itself an innovative design.

A ratchet system provides eight levels of resistance so you can choose the stick to be as floppy or as stiff as you like. This has a more important ramification for the Mousestick, since in very high resolution mode with the stick movement very light it is an ideal replacement for the mouse for any handicapped persons with even a small degree of motor function.

Versatile and reliable, but that costs. Not a serious contender for a general mouse replacement unless you have a specific task in mind.

Mousestick, Advanced Gravis Computer Technology Ltd, 7033 Antrim Avenue, Burnaby, British Columbia, Canada, V5J 4M5. Tel: 0101 604 434 7274. US$ 160.

Who uses which mouse

Simon Rockman uses the Boing!
"Because it's the best mouse you can get and impresses people, it is the secret behind my incredible high scores at Super Hang On".

Jeff Walker uses the Contriver
"Because the mice I use always break, so I need something cheap and strong".

Nic Veitch uses the Naksha
"Because John got to the Marconi Trackball first, but the Naksha is well made and accurate. It's good value".

John Kennedy (AJ) uses the Marconi Trackball
"Because it is more compact and I've only got a titchy desk. Besides, it's different"

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A host of new features in Version 1.05

HiSoft BASIC on the Amiga has already proved its worth for thousands of people because of its speed, its compatibility with AmigaBASIC and QuickBASIC on the PC and its ease of use. Now we've added features that make HiSoft BASIC irresistible. Version 1.05 gives you:

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The Extend package is available at last! The Amiga is a difficult computer to program and AmigaBASIC offers little help in using the gadgets, menus and requesters that the operating system supports. Extend gives you an extensive library of sub-programs and functions that is available from both AmigaBASIC and HiSoft BASIC to fill these gaps.

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Now you can extend the power of your Amiga's BASIC with this great new package.

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You say you want the resolution? Well David Foster has the plan

Laser largesse



EPSON'S new GQ5000 is a vast improvement on the earlier GQ3500. Visually similar, it still uses a Ricoh engine, but is now supplied with more built-in emulations – including HP LaserJet II, Epson LQ and FX – in addition to the standard PagePrinter mode and a Video mode.

The front panel incorporates a sophisticated liquid crystal display which provides information and easy re-configuration using the Epson SelecType method. Virtually all settings may also be configured from software.

The 3500 only provided Courier 12 point, EDP (the font *Amiga Computing* uses for listings) 7.2 point, Modern proportional 10 point and graphics fonts. The new model also includes Bold Courier 12 point, Prestige in 6 and 10 point as well as a compressed form of EDP. Provision is made for up to three extra font cards.

On top of the extra bit-mapped fonts, it has 13 outline fonts, including Helvetica, Times Roman and Courier, which may be used to generate more fonts in a variety of sizes. By using the HP LaserJet emulation you can download fonts if your software will do it.

While fully compatible with the earlier model, enabling old printer drivers to be used, new drivers are needed to make full use of the new features. Since most people will use it in Laserjet mode, this isn't a major consideration.

Smaller dots look better, so the 300 dots per inch output is higher quality than that from 24 pin dot matrix printers capable of 360 dpi.

Solid areas of black – a good test – reproduce well. Speed is quoted as six pages a minute. As honest as any printer manufacturer's, downhill-with-the-wind-behind-it figures, the time varies enormously depending on software and whether pages are duplicates or need composing separately.

Running costs of lasers variable. The cost per A4 page is quoted as being about two pence, but this can vary considerably, depending on the amount of text and graphics on the page. Bear in mind you need to replace the drum (£108.50) and collector (£59.50) units from time to time.

The most worrying thing is the cost of repair (minimum charge £130) if anything goes wrong, so it's sensible to take out a service contract.

The standard model only has 512k ram, sufficient for most purposes, but if you are printing pages full of graphics you will need more. Provision is made for up to 2 meg.

If you fancy a laser, The Epson GQ5000 has a lot in its favour, reasonable price, a number of fonts and emulations.

But best of all is that the commands used in PagePrinter mode are essentially the same as those used by Epson-compatible dot matrix printers. That and the quietness – a gentle fan is so much more soothing than the rasp of pins against a platen.

REPORT CARD

Epson GQ 5000
Epson 0442 61144
£1,200+vat (shop around)

EASE OF USE ...
Zillions of DIP switches make setting up fiddly. Paperfeed good. the LCD display is useful.

SOFTWARE ....
Loads of emulations which can be addressed from preferences. Shame there is no Postscript, but at this price it can't be expected.

SPEED ....
No great shakes, decoding Laserjet graphics is very slow.

VALUE ....
While the initial price looks OK watch out for the running costs.

OVERALL 62%
You need to put a lot of work through a printer to justify the price. If you want something cheaper look at the HP Deskjet.

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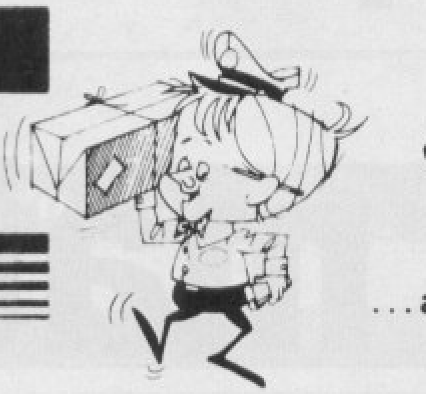
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A matter of facts

Nic Veitch discovers that information is power and wonders how many watts he can get out of Prodata

Filter tips

FILTERS are probably the most useful and the most used addition to any database. Serious data management is impossible without the ability to sort things out – this is the prime fundamental that started off IBM with their punch-card reader.

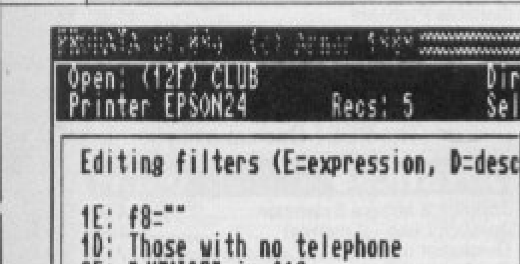
A filter is basically a set of conditions which are applied to each record in turn. If the record in question meets all the conditions it remains selected. If it fails it is thrown in a hypothetical bin.

Don't worry, the records that fail the filtering have not been removed from the database, they are just deselected. This means that you can chose to perform a function specifically on those records which have passed through the filter. Unfortunately at the moment this does not include a further filtering action.

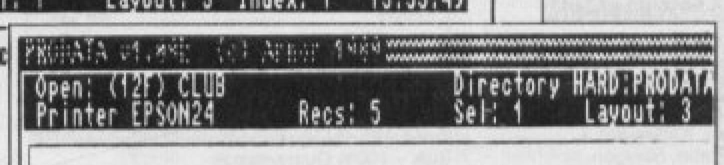
If you want to use two filters you will have to create a sub-database of the selected records, open that and then impose your second filter. If this sounds unnecessarily tortuous that's because it is.

It isn't really too difficult to do, but it's a pain, and since you'll probably only want to use the sub-database once you'll have to delete it when you are finished. Admittedly the filter structure in Prodata is very powerful and it would be simple to combine two filters into one but that is not the point, it would be much easier to have a small number of simple filters that you could use sequentially.

For example, if you had created four basic filters using them sequentially would give you 16 permutations – a 75 per cent saving on disc space and a 99 per cent saving on hassle.



Type carefully – these descriptions will become menu entries



Twenty Arnor Filters please . . .

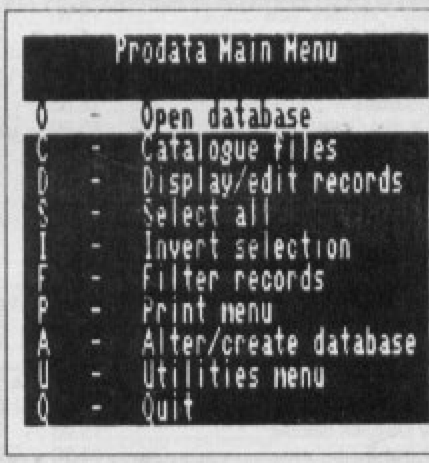
SOME say love and some say money, but it's really facts and figures that make the world go round, as anyone who has ever sat an exam or spent a sunny afternoon suffering in St Tropez will testify. If you want to make the facts and figures go round you need a database.

From a simple piece of interpolation you can reason that with a good database you can rule the world. Well, maybe not quite, but you could have a pretty good go.

It is perhaps with such an aim of world domination that Arnor have ventured into the database market. Regular readers or rabid Arnorites will undoubtably have heard of Protext, probably the best word processor in the world, and as a matter of fact the one I am using right now.

These people might, therefore, expect the same degree of professional competence at a small percentage of the price usually associated with such a package. Well, the price we know already – the rest remains to be seen.

The first thing of note about Prodata



The main menu – a road to anywhere

is that it requires 1Mb of memory. Those of you without 501s – that's the memory expansion, not the jeans – will have to splash out some extra cash to get started.

This is not unreasonable, since any database you are likely to create, with the exception of a complete list of every away match Darlington have ever won, is going to be fairly sizeable. You'll need it for lots of other things anyway.

The function of a database is to store, recall and in some cases perform actions on computerised data. For the techno-information freaks, and there are always some, Prodata can handle 300 fields per record, each of up to

Variably I say unto you

VARIABLES are not the normal run of the mill things you expect to come across in a database – a database language perhaps, but where in the day to day running of things do you need a variable?

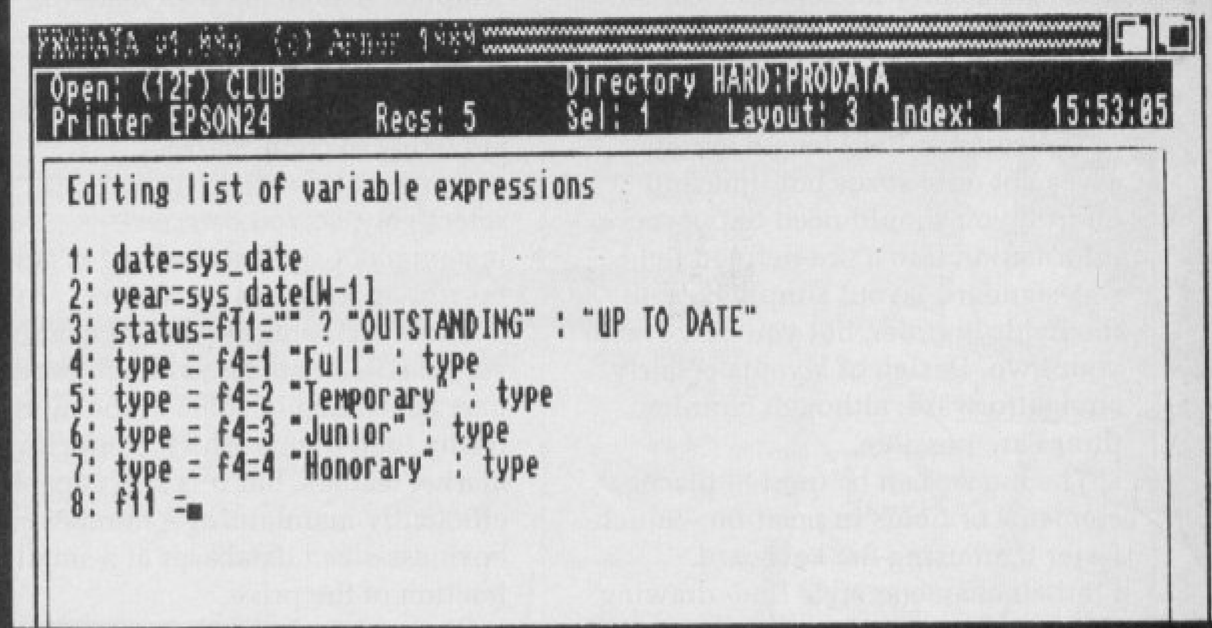
Suppose for a moment that you are a university professor with a database full of students. This should be easy unless you are actually a university professor, since they have no imagination. Further suppose that in addition to all their relevant details you have a list of their marks for coursework.

Now being lazy, you would want to see the average scores and the total so far. Ordinarily this would mean calculating them as they were entered and creating a new field for the results.

This would mean that this field would have to be updated each time a new score was added and it would probably be wrong because you'd have to work it out yourself (university professors are also very bad at counting).

With variables, not only are these values calculated and updated automatically but they take up no field space – giving you more bounce to the ounce.

Almost all the standard mathematical functions are available, while the parameters may be a constant, the contents of a field, or even another variable. It would be quite easy to turn Prodata into a simple spreadsheet.



Each database has its own variable list

Variables work with text as well, providing all the concatenation and string functions you would expect to find in a well equipped version of Basic, for example.

A number of reserved variables hold the current date, time and other system functions. Very useful, especially in conjunction with the Assign option from the menu. This allows you to change globally the contents of a field in all selected records to a variable or a defined value such as a piece of text. This is very handy, for example, if you have a field – say f1 – containing the date the record was last updated. Then you can just use "assign f1 = sys–date", and all the selected records will be automatically datestamped.

Variables excel at saving space. Instead of storing fields full of text which is repeated many times across all the records a single number may be stored which can be decoded to the corresponding text in a variable and placed in the layout.

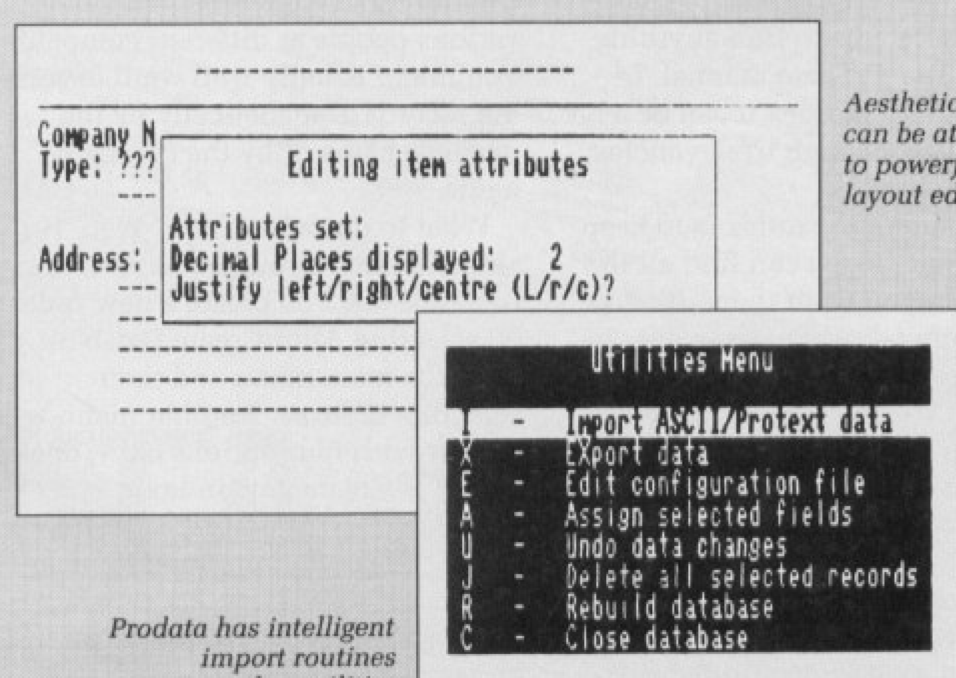
The end result is exactly the same, but with space saved in the database and time saved in the input stages.

999 characters. Prodata is able to muster such impressive figures since it uses a variable length storage format to compact the database so there is no wasted disc space.

Prodata starts with a rather simple menu in a box in the centre of the screen. All of Prodata is run from this menu and its associated submenus. It looks simple. It is simple. But behind all those entries some pretty cunning programming is going on.

You select item by pressing the corresponding key or using the mouse to click on the entry. It is worth getting to know your way around with the keys, as it will make things a lot easier when you decide to program a macro.

Creating a database was never easier. Prodata will ask you for the ➤



Aesthetic displays can be attributed to powerful layout editing

Prodata has intelligent import routines among other utilities

➤

names of the fields until you decide to stop. At this stage it will ask you if you wish to have data checked on entry. It can spot the difference between number and letters so you don't get a entry for someone called 0733-68909 with the telephone number :Arnor Ltd. Which is not only very sensible, but works very well.

The variable field length system saves not only space but time and effort if you should need to put more information into a pre-defined field.

A standard layout simply lists all the fields in order, but you may create your own. Design of layouts is fairly straightforward, although cunning things are possible.

The mouse can be used to place elements or fields in position – much faster than using the keyboard. Limited character style line- drawing is supported, as it was in Protext.

This is the place to put your variables if you have any. Fans of disgustingly neat little boxes and well arranged text will no doubt be over a natural satellite to learn that you have the option to have your text centred or justified.

Creation of several layouts for different purposes speeds access and minimises fuss when the time comes to change minor details.

Speaking of Protext – well, I was at some stage I'm sure – there are good facilities for importing and exporting text from/to Ascii or Protext format.

The import routine is very intelligent and can accept comma delimited, single line or quote wrapped data items which are the main outputs from other databases, spreadsheets, Basic programs and virtually any source of raw data you are likely to come across.

You are also able to import data selectively, so you can see instantaneously if something is going horribly wrong and try again.

These elements combine towards a very flexible database system. Prodata may be lacking in some of the more flashy ingredients which comprise the market leaders, but it is still capable of efficiently maintaining a number of business-sized databases at a small fraction of the price.

Its simplified structure offers great bonuses in terms of ease of use, the only drawback being lack of a programming language, which in any case is only useful in large scale installations.

Prodata lacks a sense of Amiganess, as does its pen friend. Yet it is impossible to use just the mouse even to get simple printouts, which is a bit of a nuisance.

It may feel alien to the Amiga, but at the same time powerful, slightly primitive perhaps, but with ripples of ingenuity just below the surface. Overall a sense that if you can't find a way to do something with Prodata, it is due to your own shortcomings and not the program's.

REPORT CARD

Prodata
Arnor Ltd 0733 68909
£79.95

EASE OF USE ...
Structure of menus simple and fairly efficient. Could have been a bit more Amigaised though.

SPEED................
Fast. Of course you have to wait for long searches but no database is instant.

VALUE...............
Perhaps not quite as much of a bargain as Protext, but certainly a high performance to price ratio.

OVERALL 87%

Prodata will never beat Aston-Tate but unless you are worried about corporate image it is competent, reliable, easy to use and excellent value.

A to Z of indexes

INDEXES are a man's best friend. Book index, refractive index, FT index, index-linked pension, you even have a finger put aside for them.

Without indexes, for example, you would never be able to find anything in the extensive Prodata manual. In fact, even with the index it can be a bit trying. Anyway enough irrelevancies, on with the blurb.

The function of the index is to keep things in order so you can find all the records when you want them. It's sort of like a mother, but it never wants to know where you were last Tuesday when it was ringing you all night and it hopes you are wearing a vest because you could catch your death. It's not like the old days when people had respect....

All databases need to have at least one index, otherwise Prodata would get confused, so as a default the first field is taken to be the index field.

This is all very well, and normally that is all you would need, but suppose you had a database containing details for a mailshot to various people at different companies. You might equally well want to sort the records alphabetically by the person's name or by the company name.

What to do, what to do? Well, it's simple really – you just have to create two indexes. You create a new index by selecting Alter/Create Database from the main menu and then selecting Indexes. Another menu will appear with four options on it, one of which is Create new index.

Enter a description for your new index. It is quite important to make this description something sensible so that you know what it means when it appears on the menu later on.

Next comes another cunning bit. You can have more than one field as the index. In the previous example this would be quite useful, since you could index first in the name of the company and second in the name of the person, as there may be two people on your mailing list working for the same company.

An index can be specified over up to four fields – more than you could possibly want to use unless your brain functions in some fashion previously undocumented by modern science.

It is important to note (your important notebook must be getting pretty full by now) that any searching function you perform will only look through the fields that are designated as index fields. Therefore you must make sure that any fields you are likely to want to search feature in at least one index.

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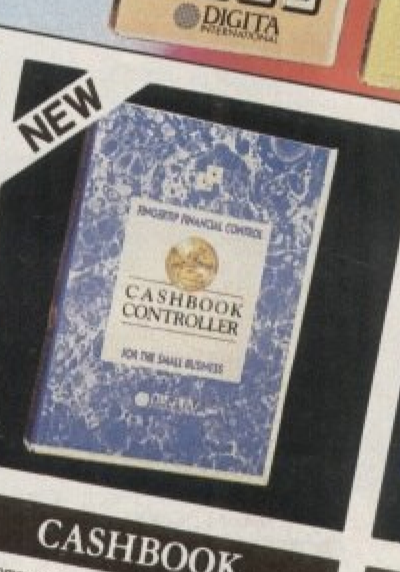




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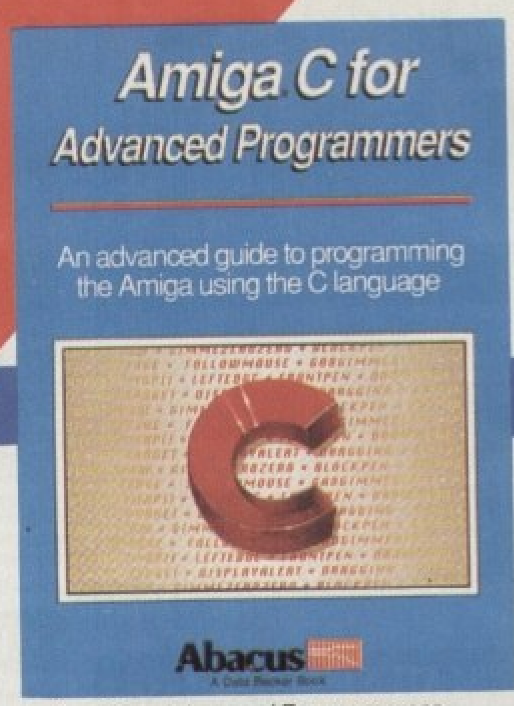
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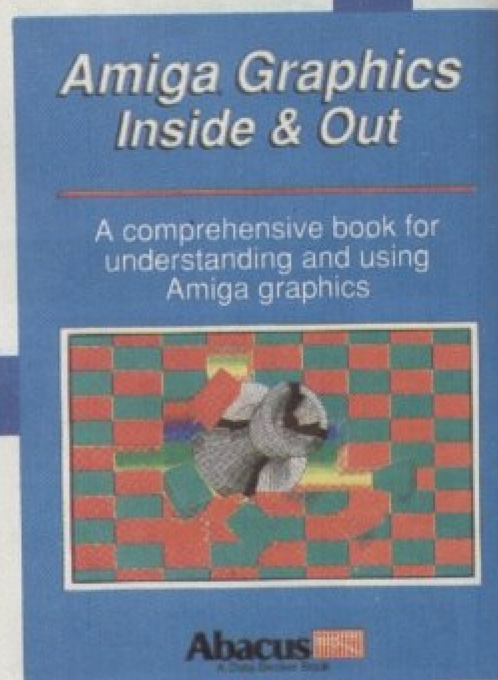
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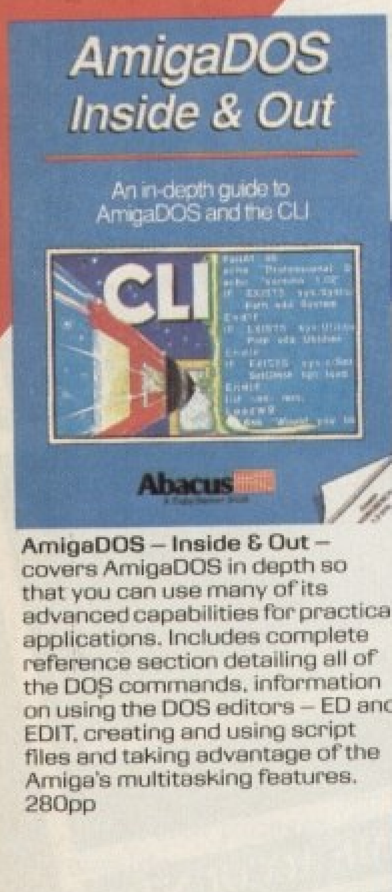
New Titles for Amiga



Amiga C for Advanced Programmers – contains a wealth of information from the pros: how compilers, assemblers and linkers work, designing and programming user friendly interfaces using Intuition, combining assembly language and C code together. Includes complete source code for a working text editor.
April 1989 about 380pp



Amiga Graphics – Inside & Out – an in depth treatment of the Amiga's super graphic features and functions. Learn how to access these graphic features from AmigaBASIC or C. Learn graphic programming in C with examples of points, lines, rectangles, polygons, colors and more. Contains a complete description of the Amiga graphic system – View, ViewPoint, RastPort, bitmaps, screens, and windows, more.
May 1989 about 450pp



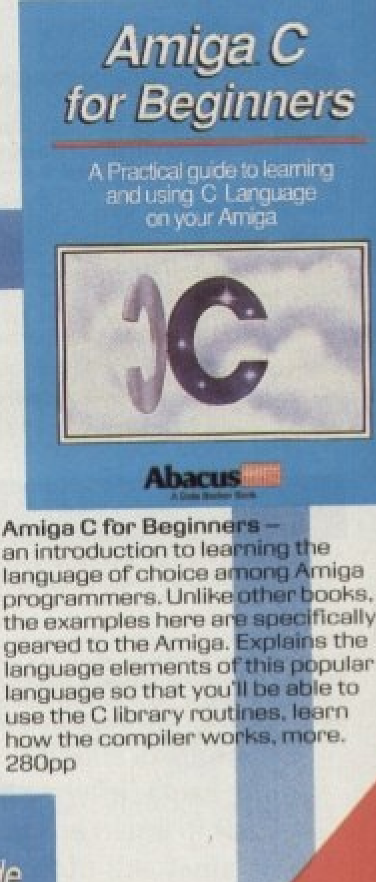
AmigaDOS – Inside & Out – covers AmigaDOS in depth so that you can use many of its advanced capabilities for practical applications. Includes complete reference section detailing all of the DOS commands, information on using the DOS editors – ED and EDIT, creating and using script files and taking advantage of the Amiga's multitasking features.
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Tricks & Tips – here is a large collection of useful and important programming techniques that makes working with your Amiga friendlier and easier. Presents dozens of tips on accessing libraries from BASIC, making and using custom character sets, using AmigaDOS, important 68000 memory locations, and much more.

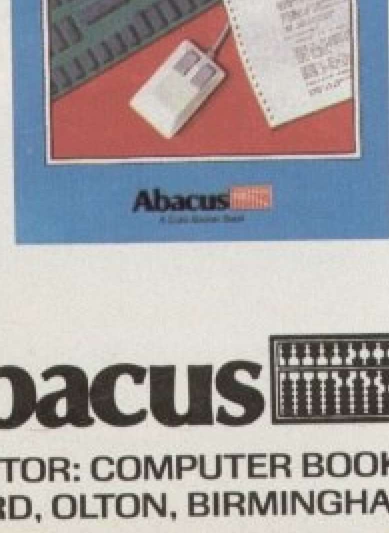


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Amiga Machine Language – is a thorough introduction to 68000 assembler programming and is a practical guide for learning to program the Amiga in ultra-fast machine language. Covers 68000 microprocessor architecture and addressing modes, making speech and sound from machine language and more. This book is also a perfect companion to our AssemPro machine language development software.
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If the good way is to use the OS, and the bad way, the hardware, who's ugly? asks John Kennedy

The good the bad and the ugly

This article is aimed at the programming literate who are having problems getting to grips with the challenge of programming the Amiga. It makes reference to C, but only in comparison to assembler.

SIX months ago I bought the Rom Kernal Reference Manual – my attempt to learn how to program the Amiga and become rich and famous. I even started calling it the RKM like proper programmers do. My Lattice C compiler documentation under one arm and the RKM under the other, I was confident of games within a fortnight. I was wrong. And it wasn't just because I couldn't type with a book under each arm.

Two weeks of hard graft and I could open screens and windows. Big deal. A fortnight of pointing pointers and constructing structures to could produce a rectangle with my name on it. After three weeks I managed to get a sprite on to the display. But it was the wrong colour and wouldn't go where I wanted.

I decided that programming the Amiga was too difficult for me, and went back to the comfort of my little friend, the Z80. Sure, I kept using the Amiga, mostly for word processing and playing with ray tracing, but that nagging feeling was still there.

The little voice in my head said: "Why aren't you programming? You spent all that money on a brilliant computer, and you aren't using it properly!"

"Naff off", I said, "I'm busy. And besides, I tried once and it was too hard".

Time passed. After a few months I was tired of watching games fall into Green's In Tray. I could write games too. I knew I could. I wasn't stupid - I knew how to program. There must be some trick to programming the Amiga that didn't involve the mind-numbing complexity of integrating Intuition with Kernighan and Ritchie. I decided to give it another go.

So last week I bought another book and today I am almost half way through my first game. OK, so it's not a commercial product, but it will work, looks good and will be all my own work. What more could I ask?

And what was the book I bought? *How to write a game in one easy lesson*, by Jez San? Nope.

Fifty ways of being brilliant on the Amiga by Jolyon Ralph? Not quite. (Although I admit that his articles in *Amiga Computing* definitely put me on the right track.)

How to program and be cool by Green? Definitely not. Well, only a quick glance.

It was the official Hardware Reference Manual, and it opened my eyes to the Amiga. Later the same day I got it, I was already playing with screens and bitplanes. The day after I was animating sprites. It was easy - and I had hardly ever used 68000 machine code before.

So that you can see the difference between methods, I'll show you how to display a screen with Intuition in C and how to do it from the hardware and assembler. It is entirely possible to use Intuition from assembler, but this is an ugly way of doing things.

Intuition was designed to be used from C, and using another language makes things even more difficult than they already are. You can interface with the OS using languages such as ➤

What is a bit plane?

FIRST we choose the resolution. This can be 320 or 640 pixels in the horizontal and 256 or 512 lines in vertical resolution. The flicker caused by the 512 line interlace when used with simple graphics screens is normally prohibitive.

The number of colours we require specifies how many bitplanes we need. A bitplane is a binary representation of a screen or sprite.

If only a single bitplane is used, the image is in monochrome and each pixel is either on or off.

```
00001110000
00001110000
00000100000
00011111000
00000100000
00001010000
00010001000
00100000100
```

To get more than two colours, we overlay several bitplanes. This involves setting up another bitplane in an separate area of memory and telling the hardware the the screen display will use both planes to generate the picture. Now each pixel has two related bits in memory from which to generate colour information.

With two bits, we have four possible numbers, and so four colours. Similarly with three bitplanes we have eight colours, with four bitplanes 16 colours and with five bitplanes 32 colours.

Point to remember: Each bitplane takes up the same amount of memory, and a five bitplane, hi-res interlaced image uses a LOT of space.

There ain't no such thing as a free lunch.

➤

Pascal or even Basic, but C is preferred.

The eternal question: Should we program the good way, using legal operating system calls, or the bad way, dump the OS and talk to the hardware? To mis-quote: "To use the OS, or not to use OS, that is the question. Whether to suffer the structures and libraries of outrageous Intuition, or to take up assembler against the sea of registers".

The answer is simple. It's "Yes". We should use both, depending on the application. To write multi-tasking software that integrates into the Amiga way of doing things requires legality or coding and great perseverance.

It is true systems programming – the sort of systems programming that professional programmers in the real world of PCs and VAXs and UNIX use everyday. It's also the sort of programming that pays between £15 and £25K a year, so it's not to be scoffed at.

But if you want to write a game, well then the only sensible approach is to drop the OS and play with the custom chips. This approach is one which I fully endorse to budding Amiga programmers.

Yes, it's a bit, well, rude. Yes, it's dumping the most powerful and complicated operating system ever written for a home computer. But by its very nature Intuition takes time to master.

Writing a program with it is not the best way to get to know the hardware. It's a good way to get to know Intuition, but it's also a good way to get totally bogged down and give up.

Only by understanding and becoming familiar with the copper and the blitter will you be aware of what is possible. And it is only by talking to the hardware directly that you will understand what is going on.

Therefore don't be afraid of reading and writing custom chip registers.

What is the copper?

The copper is a co-processor (copper, co-processor, geddit?) which ticks along in the background helping out the 68000. It is a simple beast, and only executes three types of instructions. The most common instruction is equivalent to a 68000 MOVE.W, and as it it synchronised to the Amiga's screen display. It is mainly used is writing to the custom chips that control screen modes and sprites.

They are there to enable you, the user-cum-programmer, to make the most of your machine.

If you have arrived at the Amiga via another home computer and know machine code well, then buy the Hardware Reference Manual and a copy of Devpac. From the inside, the Amiga is very easy to program indeed. The custom chips are all there to help you.

Don't waste time developing a brilliant new sprite routine, the Amiga gives you as many hardware sprites as you need. Techies might argue that there is a limit of eight per pixel line. This is no worry. You won't need more.

Setting up backdrops for graphics? Just use Deluxe Paint and you're flying. And if you are apprehensive about the change over from 8 bit assembler to 16 bit - don't be. 68000 code is as simple as Basic compared to other codes. You have eight data registers and eight address registers to play with, and more addressing modes than you would know what to do with.

If you are experimenting with Amiga machine code it is unlikely that you will try to use a non-existent opcode, because opcodes exist to cover nearly every eventuality. Talking to the hardware is only a matter of writing and reading from memory addresses which happen to be mapped on to the custom chips. Just like on a C64.

If you are totally new to programming, you have a long road ahead of you. Ploughing through AmigaBasic - or better still, HiSoft Basic - will provide you with a thorough grounding in programming skills. You will even be able to play with the blitter without worrying about poking around in the hardware. But you will need an inquiring mind and a good book to learn machine code on the Amiga.

I really wish that the demo writers would stop amazing everyone (yawn) and write some useful programs or fun games. OK, it might take slightly longer and require some thought, but at least a game would serve a purpose.

We *know* the Amiga is capable of nice graphics and wonderful sound. We *know* that the copper is good for lots of coloured lines. Now go away and don't come back until you have something I can shoot at. Or better still, just let me get on with writing my own game.

68000 machine code for assembly programmers

UNDERSTANDING 68000 code is best done by buying a good assembler, a good book and hacking away. The Motorola beastie has lots of 32 bit registers, eight data registers and eight address registers to be exact.

The instruction to get data into them is MOVE.

MOVE.B #10,d0	Move a byte '10' into data register 0
MOVE.W $1000,d2	Move 16 bit word contents of hex 1000 into d2
MOVE.L #plop,a0	Move 32 bit address of label plop into address register 0
LEA.L TABLE,a1	Load Effective Address of table into an address register. Just like MOVE.L #TABLE,a1 but faster.

GOTOing is achieved using BRA (for BRAnch). You can branch on conditions ons such as Equal or Not Equal by using instructions such as BEQ or BNE.

JSR or BSR will call a subroutine, and RTS will return. Easy.

Opening screens with Intuition and Assembler

Intuition and C

To open a screen under Intuition you must construct C structures to handle all input and output. These structures are then used by calls to Libraries of operating systems functions, which are used to open a screen or whatever.

```
/*******************************************/
/* Example program to open a new screen  */
/*******************************************/

#include <exec/types.h>
#include <intuition/intuition.h>

struct IntuitionBase *IntuitionBase;
struct Screen *MyScreen;

main()
{
    SHORT y,w,h,d;
    SHORT mode;
    UBYTE *name,colour0,colour1;

    void delay_func();

    /* Open Intuition Library */

    IntuitionBase=(struct IntuitionBase *)
        OpenLibrary("intuition.library",0);

    if (IntuitionBase==NULL)
        exit (FALSE);

    /* Open a Screen */

    name="My Screen";
    y=0;w=640;h=200
    d=3;colour0=0;colour1=1;
    mode=LORES;

    Screen0=(struct Screen *)
        open_the_screen(y,w,h,d,colour0,colour1,mode,name);

    CloseScreen(Screen0);
    CloseLibrary(IntuitionBase);
}

open_the_screen(y,w,h,d,cl0,cl1,mode,name)

UBYTE cl0,cl1,*name;
SHORT y,w,h,d;
USHORT mode;
{
    struct NewScreen NewScreen;

    NewScreen.LeftEdge=0;
    NewScreen.TopEdge=y;
    NewScreen.Width=w;
    NewScreen.Height=h;
    NewScreen.Depth=d;
    NewScreen.DetailPen=cl0;
    NewScreen.BlockPen=cl1;
    NewScreen.ViewModes=mode;
    NewScreen.Type=CUSTOMSCREEN;
    NewScreen.Font=NULL;
    NewScreen.DefaultTitle=NULL;
    NewScreen.Gadgets=NULL;
    NewScreen.CustomBitMap=NULL;

    return(OpenScreen(&NewScreen));
}
```

Assembler

Opening a screen by writing directly to the custom chips and setting up a copper list to keep the screen addresses updated. It is much simpler to get working than the Intuition system - just don't expect it to multi-task.

```
#include custom.header              * Definitions of labels *

   move.l #SCREEN,d0       * Set screen pointers *
   move.w d0,pl1l
   swap d0
   move.w d0,pl1h

       lea CUSTOM,a0              * The start of chippery.  *
   move.w #$0,BPLCON1(a0)         * Define limits of screen *
   move.w #$0,BPL1MOD(a0)         * by writing directly to  *
   move.w #$2c81,DIWSTRT(a0)      * hardware registers.     *
   move.w #$2cc1,DIWSTOP(a0)      * All these numbers are   *
   move.w #$38,DDFSTRT(a0)        * well documented in the  *
   move.w #$d0,DDFSTOP(a0)        * Hardware guide.         *

   move.l #new,COPPERLIST      * Patch in New copperlist *

   rts

new:   dc.w BPLCON0,$1200      * The new copperlist *
   dc.w BPL1PTH
pl1h   dc.w $0
   dc.w BPL1PTL
pl1l   dc.w 0
   dc.l COPPER_HALT         * End of copperList *

GFXNAME dc.b "graphics.library",0
SCREEN incbin "screenbitmap"       * Load a prepared screen map
*
```

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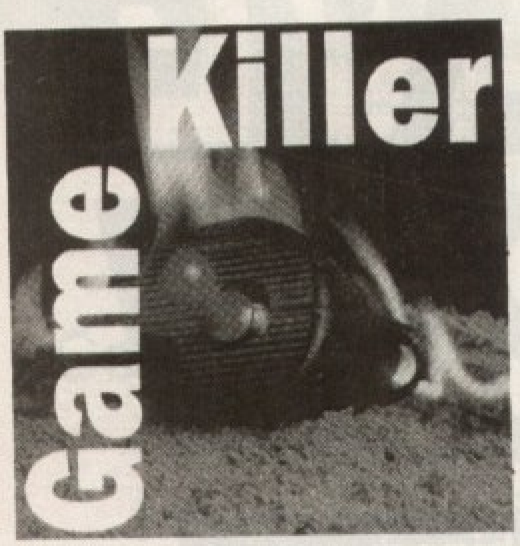
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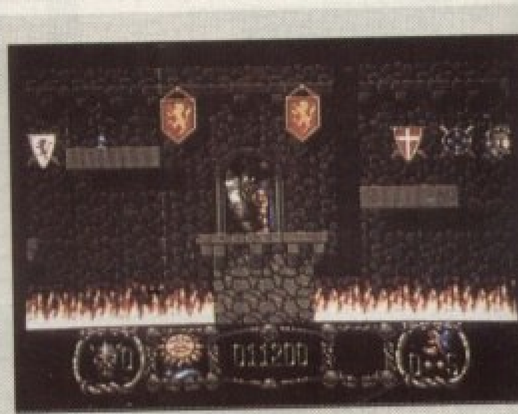
SEE ORDER FORM ON PAGE 113



Stormlord

TONY "ZAX" PALMER says: Please could you include this cheat for Stormlord in your brill mag. When playing the game type in CHEAT for unlimited lives and again to turn it off. Press space to pause the game, B to jump higher and L to skip to the next level.

FRASER BAIN says: Once the game has loaded completely, start a game then hold down the C. Then press the fire button and push the joystick to the right simultaneously, and let go. This will give you infinite lives for that level only; you must use the cheat again for each new level.



MTH says: I tried to test these on the office copy but since this was pre-production it didn't work.

No worries

Max Tennant tackles football, driving and other problems

TV Sports Football

PHILIP RICHARDSON says: If you are playing in a league and lose a match do not insert Reel 2 at the prompt, just switch off. Next time you boot up the game you can replay the match.

Rock 'n' roll

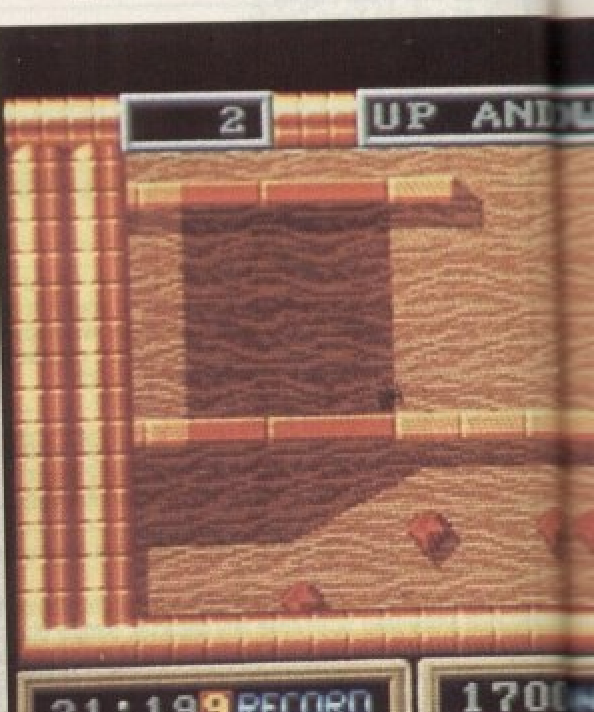
DAVE KYLE says: You can warp from level six to level eight by placing three platforms in the correct positions. The action takes place in an area with many ventilators where the railing is missing in the lower right corner. If you place one platform in each row the warp will be activated.

You can warp from level four to 11 by smashing all the eggs. To get to the egg area you must buy one repair set and place it to the right of the middle arrow. Then it is possible to roll over the abyss until you reach the egg area.

To warp from level 14 to 18 you must smash the correct eggs. In the big egg area you have to roll a ›M‹ into the separated zone and a ›G‹ into the separated zone to the right. You are not allowed to smash any other eggs.

You can warp from level two to 20 by smashing the correct eggs in the egg area. You have to smash all the eggs near the railing. You are not allowed to smash any others.

The warps get bigger and better. You can warp from level three to level 24 by placing three platforms in the correct positions. Near the starting point you will find three repair set shops and to the right a small abyss area. The warp is activated by placing all three platforms in the middle row.



The best warp I've found is from level one to level 33 (the bonus level). Near the start of the game there are two passages with holes and a blue diamond and a yellow key behind them. Just past these

Hard Drivin'

PAUL RAMSELL says: This tip for Domark's Hard Drivin' will be a great help to anyone struggling to complete the speed lap in less than two minutes and challenge the Phantom Photon.

When the game loads select Manual Shift (No clutch) and start. As you move off up the hill under the start light get into fourth gear as soon as possible by using the number keys on the main keyboard. Stay in the righthand lane.

When you reach the top of the hill your car should leave the road for a second. The speedo will flip around to 140 mph. Before you land, quickly press the N key to put the car into neutral. You will now be able to complete the course without skidding or having to brake.

If your time runs out you will be able to keep going at the same speed, even if the tone of the engine drops to a tickover.

Selecting neutral at any stage will stop you from skidding and will maintain your speed regardless of the amount of time remaining. Once you have passed a checkpoint you will still be awarded extra time. So if time runs out quickly press N and wait until the next checkpoint before accelerating again.

The stunt course is a little different, because while using neutral works in most places, the loop is an exception. Select first gear just before you enter the loop and as you leave it accelerate quickly and again select neutral in time for the banking.



Peter Beardsley's Football

SHAUN FORSTER says: When making a run from the centre or goal kick, flick the joystick on to auto-fire and keep running in a straight line. You should be able to take the ball past opposing players with no trouble at all.

Once you are past them and are sure that no one else can tackle you, turn off the auto-fire and dribble round past the keeper.



landmarks is a toolkit shop with a hole behind it. Buy the kit and fill the hole to activate the warp.

In addition to the warps there are several puzzles to be solved. Here are some of them. Smash all the eggs on levels two, five, 11, 12 and 14. On Level two roll over all the fragile floors making holes.

Write to Max

GAME KILLER is always on the lookout for hot tips, so if you have found a cheat mode, bug or written a poke then drop it in the post – on disc if it is a long listing. If your work is used I'll send you a game drawn at random from the goodies box and a Konix joystick.

To speed up getting the prize to you please cut out, photocopy or copy this form. It will be used as the address label to send out your parcel so please write neatly. May all your bugs be simple ones.

I have supplied tips/pokes/cheats for

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Name ....

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I confirm that the information I have supplied is mine, it hasn't been published elsewhere and I haven't sent it to anyone else.

Send this form to Max "The Hax" Tennant, Game Killer, Amiga Computing, Second Floor, North House, 78-84 Ongar Road, Brentwood, Essex, CM15 9BG.

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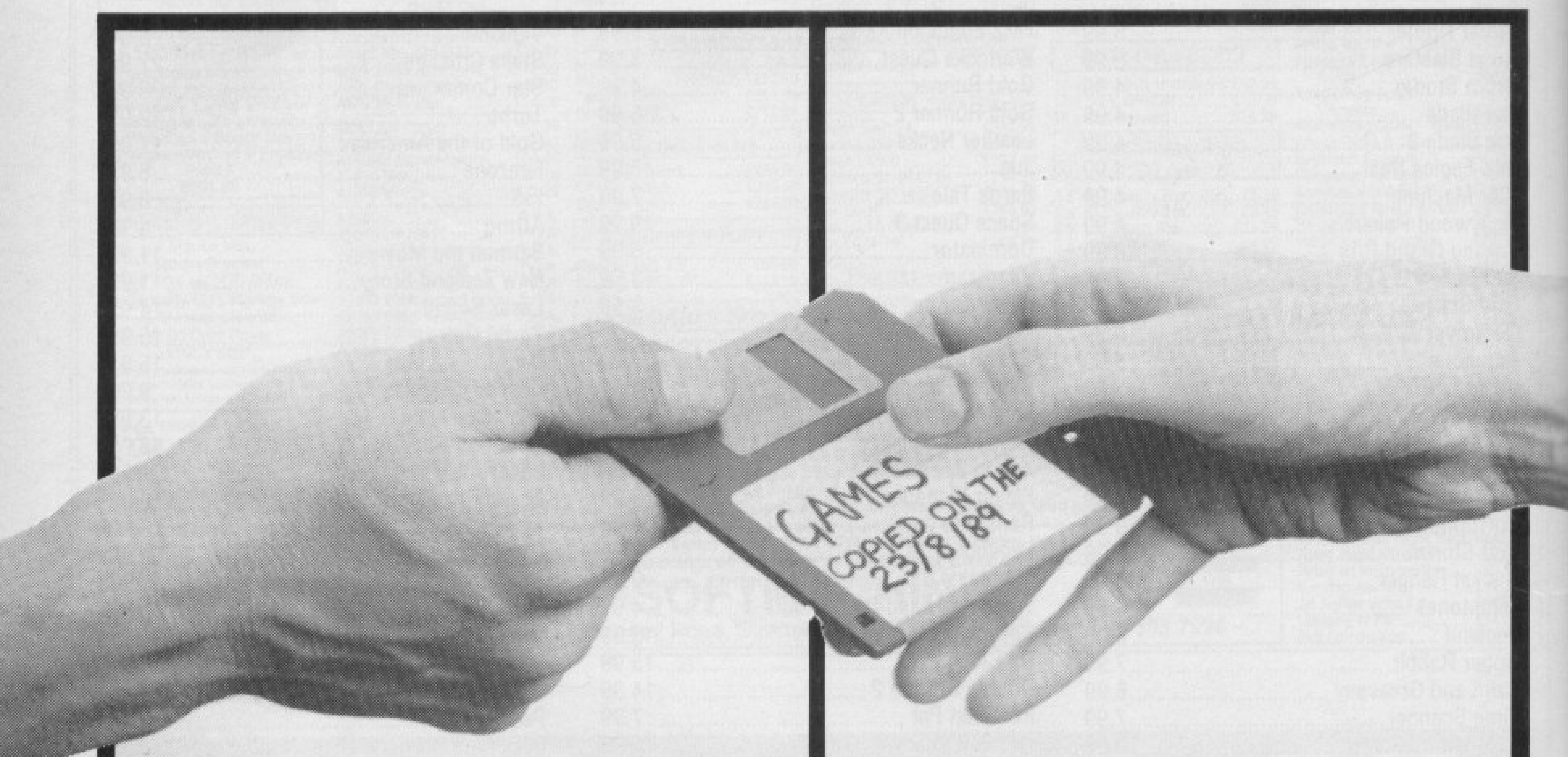
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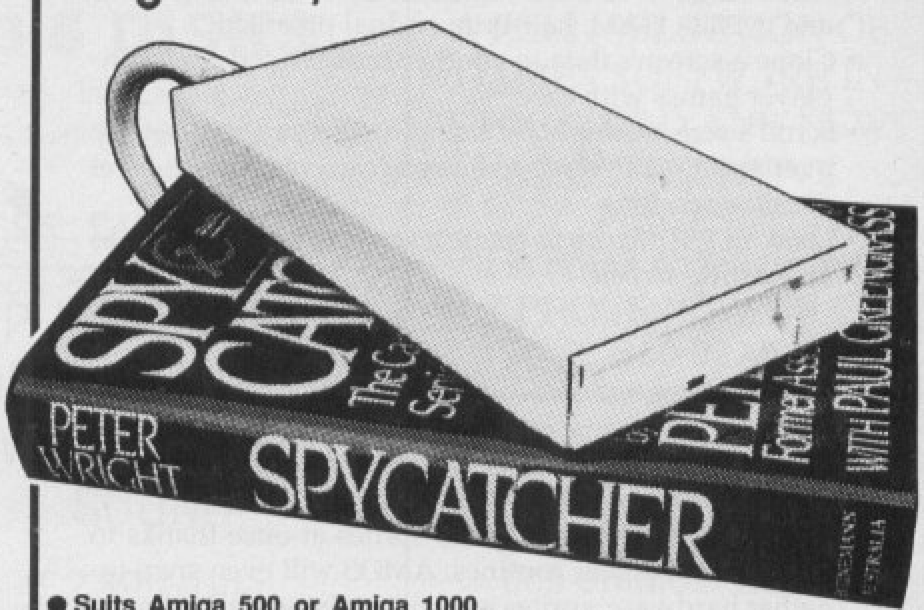
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Ezra



Protect and survive?

SOFTWARE protection is a waste of time. If a disc is protected, crackers will almost certainly hack the protection out and spread the game worldwide. Protection will stop the average schoolboy from swapping the game in the playground, but will lead to far more copies being spread in the cracking circuit.

Protection normally means the owner of the original can't make a backup copy or transfer the game to hard disc. This means that although you may have a hard drive, you can't actually make use of the thing.

Protection hinders the game. Speedball and Xenon II for example, won't load on a machine fitted with Kickstart 1.3 even though the game would work fine if it was unprotected.

Novella protection is not very good either, as it is annoying having to search through a whole pile of books. It can be hacked out, thus the game enters the hacking circuit.

Money spent on protecting games is wasted. Take Shadow of the Beast, for example. This has some of the most advanced protection schemes, and yet was cracked days after it was released.

Although the protection means the game can't be copied, the cracked version will be copied hundreds of times and so the protection has probably led to more copies being made than there would be otherwise.

If there is going to be protection, the best type is the key-disc as used in PowerDrome. You are allowed to backup a game and then asked to insert the original once the backup has loaded to make sure you haven't pirated the game. At least the legitimate user is allowed to make a backup for safety.

It is a sad thing that software houses spend money on stopping unscrupulous people from stealing their work.

Roy Weekes,
Sheerness, Kent.

Software companies really don't want to protect their software, honestly they don't. However there are so many dishonest people that there is a real need.

I hate people who have only seen pirate versions of a game and then dismiss it as unplayable because they haven't seen the instructions.

Listening corner

HELP blurp shulf ans lubno delsh ibfelt bmuft. I'll translate for you (Double Dutch). You see I'm a musician really, and not very educated in the computer region.

I have bought an Amiga and I have acquired a pirate copy of Soundtracker because as you say in your issue number 7 volume 2 they are no longer obtainable. Because it's a pirate copy I received no instructions.

I have proceeded into Soundtracker as far as my abilities (limited) can take me and hit a stump. Could you help me and find a set of instructions for Soundtracker 2.4. Also could you tell me where I can purchase the clones, Lineltracker, Pro-tracker, Sidmon and Seq. Many thanks.

Kevan Roberts,
Chesterfield, Derbyshire

Some versions of Soundtracker come with documentation files. I'm certainly not going to help you with a pirate program. All the clones are based on the original, which is available from Active Sales and Marketing (01-384 2701).

This isn't worth buying, but negotiations are under way to sell the Noisetracker clone. Seq is a complete re-write which will probably be PD if Sam finishes it.

Adding Life

FULL marks to Philip Gibs on his version of Life on the December cover disc. Seeing that he also did the Mandelbrot program, he obviously enjoys this type of exercise.

I'd be interested to hear if he's tried any of the programs featured in the Scientific American's Computer Recreations section, I'm sure he would find some of them fascinating.

I wasted a huge amount of time entertaining myself with the problem of finding starting configurations which would grow into a worthwhile population.

I found that asymmetrical starts are generally much more successful than symmetrical, and four-way symmetry seems to be a dead loss - the tribes die almost at birth every time.

George Crawshay,
East Horsley, Surrey.

Ram hungry

I HAVE an A500 and A501 half meg expansion plus an Amigos hard disc which is attached through the expansion port. I now want to expand my memory to 3 meg total (adding 2 megs to the one I already have), but with a facility to add more at a later date.

Could you please tell me the best and cheapest way to do this compatible with the hardware I already possess?

Bruce Neville,
Harringay, London.

Since I don't know if the Amigos drive has a through bus, one option might be an internal board which fits inside the machine, not in the trapdoor. This does in the warranty but trapdoor boards which offer more than 512k need to hook on to the Gary chip to get to the extra address space do similar things to your rights.

Something like the EXP 8000+ from Progressive Peripherals and Software should fit the bill.

Transformer fan

YOUR December issue attempted to answer a question about the use of Lotus 123 on the Amiga. You failed. The answer you gave was at the very best unhelpful.

To set the record straight, I am the proud owner of Amiga Transformer. This is not a failed product, neither is it unstable, as it was described in another magazine.

Transformer runs the vast majority of text-only PC programs that I have tried on it, however a few tips may be useful for potential users.

Transformer is not supplied with MSdos, therefore you will have to buy it separately, or use a copy that you already own if it is legal.

I am running Transformer under MSdos 3.20 with no problems, it is less happy if you use Dos 3.30 or higher. Nobody should be using Dos 1.X or 2.X now.

Transformer will not format discs to 720k, only 360k. You can get round this if you use Diskcopy to copy a 720k formatted disc on to a blank disc, however this will not ➤

work with different sizes of disc such as copying from from 5.25 to 3.5.

Cumana supplies a device driver with its 5.25in drives which cures this problem, both for internal and external drives.

Transformer is slower than a PC – at about 20 per cent of the speed – and does not support graphics. It is therefore not suitable for really high-powered work, although it manages to directory a disc faster than Amigados.

Lotus 123 may well not work with the emulator due to lack of memory, however people who would like to work with Lotus files on their Amiga at home could try AsEasyAs, a Lotus 123 shareware clone which I have used successfully on the Amiga.

I have to have PC compatibility on my Amiga for my studies (it's not just masochism). This letter was written on Micro EMacs on the Amiga, ported to MSdos using PCUtils on the Extras disc, formatted with PC Write running under Transformer and printed on an Opus PCII.

A. L. Booth,
Stockport, Cheshire.

Using Transformer sounds a real masochists tango. I've been using a real PC, running at 8Mhz, recently and it sucks. The whole thing feels tatty and the software isn't a patch on the stuff we have for Workbench. Life is too short to wait for something which runs at a tenth of the speed.

Easy learning

IN my spare time I am taking a correspondence course in computer programming in Cobol and I would like to know if there is a compiler available for my machine? Can the Amiga A500 be made IBM PC compatible? If so then how?

When using Amiga Basic how can I get printouts of my listings? Finally are there any recognised qualifications that can be gained in computer programming in C, as I would like a career in this field? Being too old (24) to be a trainee programmer, I feel it is now up to me to educate myself.

Do you know of any courses available in my area, or are any correspondence courses available. Thanks for your time and a great magazine.

Mark Hampson,
Toton, Notts.

There are no Cobol compilers for AmigaDos. You could try to get hold of a copy of Transformer - Mr Booth likes it, so Commodore must have made a mistake when it was discontinued - or get hold of the public domain CP/M emulator. Using either of these you should be able to run a version of Cobol.

I'd go for CP/M, because then you can get a smaller Cobol which won't have any ram problems. Softville on 0705 266509 can supply the CP/M, WACCI on 01 898 1090 will provide NPS MicroCobol version 2.1 on 720k format disc. To read this you need Dos to Dos which you can get from Amiga Centre Scotland 031-557 4242.

Amiga Basic listings? try LLIST in the main window. The world needs C programmers; you don't need formal qualifications to get a job, and I wouldn't say you are too old to become a trainee.

Zortech on 01-316 7777 does a video course; you'll need a VHS video and a PC compatible. It costs £230. The Instruction Set runs intensive courses. They are very good but pricey at more than £500. For more details call them on 01-251 2128.

Colour blues

I HAVE been especially impressed with Deluxe Paint. Determined to make the most of this great art package, I bought myself a Star LC10 colour printer. This gives great black and white graphics, but I cannot get the colour graphics to dump when using Deluxe Paint.

The colour ribbon works when I do a test dump. There isn't a description of the LC10 in preferences, so I chose Epson, since this was the suggestion given in the printer book. If anyone can help, I am sure it will be *Amiga Computing*.

Arnold Synnott,
Newark, Notts.

No worries. Select Epson JX-80 as a printer driver and save the preferences to the disc you use when you load up to run Deluxe Paint.

Demo give-away

THIS letter is going to start like most of your letters do ... Congratulations on a good job. I have every issue.

I heard people writing and talking about game demos and I think this is a good idea. Software houses should issue these at say £1 each and it should contain a playable game demo.

Joel White,
Stanmore, Middx.

Better than this is the scheme of free PD demos. DMS did a disc for Drivin' Force, Readysoft for Dragons Lair and Space Ace and EA for Interceptor. But they only work if the game looks decent.

You beast

DISGUSTING! Your Dec 89 cover disc had a fatal flaw. All the programs bar one will be useful to me and lots of readers. The one very rotten apple is the Beast hack.

The excuse rendered is that Beast is too difficult. That may be so, but barely two months after its release you have hacked into it and released the hack nationwide. The timing is the worst part, I guess. I haven't touched it, though I've been tempted. I know it would ruin the game for me.

I wonder how the authors of Beast feel about this. I suppose in time they would release the trapdoors they no doubt built in to the game... but two months?

Considering that Beast is probably in the top three Amiga games the release of the hack was tactless and inconsiderate. To round off this with a smack in the face, your cover article just happened to be "Piracy - it's only a game" and the article slagged off those who spend their time breaking program security. Hardly a fitting compliment to Mr Justin G?

John Gold,
University of Bath School of Mathematical Sciences.

Who got out of bed the wrong side this morning? Well, the programmers of Beast are probably laughing to themselves because the version we had was from the first batch and they changed the program, which means that Justin's hack doesn't work with later white labelled discs.

The change was necessary because the protection stopped the game from loading on some Amigas. The competition to be first with hacks means that sometimes things get out too early.

Super Silica

I HAD to drop a line to let your readers know how good Silica Shop are. I'm disabled and bedbound and use my Amiga A500 to play games mainly. When I had a faulty disc drive Silica Shop checked my discs and collected and changed my Amiga within 12 days.

I had a new mouse and Amiga they even upgraded my Workbench discs to V1.3. I think I must be brain dead, because I cannot for the life of me get Workbench 1.3.2 to work. I keep on getting ram disc full.

Lastly I have a tip for your readers, don't let anyone borrow your half meg expansions no matter how good a friend, they move house without telling you. Mine did anyway.

Paul Simpson,
Caxton, Derby.

Your 1.3.2 upgrade should work with no problems. Make sure you boot from the cover disc and don't have any extra drives plugged in. You could send out a private eye to pick up the chap who had nicked your half meg I suppose.

Name trouble

ENCOURAGED to purchase an Amiga 2000, I have eventually weakened and done so. Please tell me I haven't done the wrong thing. I am well past the age of ever becoming a techie (37) but feel that this advanced age should not preclude me from the interest and enjoyment that I'd previously experienced with a ZX81, Spectrum, BBC B and a PC1512.

The Amstrad introduced me to the delights of MSdos an operating system I had originally felt was designed to punish people but which I had finally grew to accept and even feel happy with. Having since been introduced to Workbench and CLI, I now miss it deeply.

I am sure your magazine will run and run if only by offering just one more CLI snippet to us poor guru crazed OAPs. Certain files ➤



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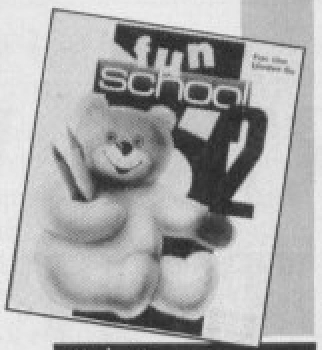
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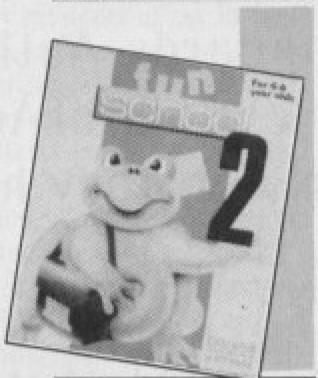
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have names with spaces in them. "From Arnor Ltd" is an example. When I type this, the brute informs me that it can't find the file. It works fine from the Workbench by clicking on the icon.

Also tell me again I've got a great machine and that finally I'll be writing letters of praise rather than panic.

Dave Beard,
Cheltenham, Glos.

You haven't done the wrong thing. There. Feel better? CLI requires a lot of patience. Soon you will be typing strings of commands like a wizard with magic spells. You have already identified the solution to your problems. Quotes. Put "s around the From Arnor Ltd to run the program.

Watch the birdie

EVERY weekend I a shoot a marriage movie. I am using my Amiga for titling. Since I'm a working professional, the results need to be just so. I'm just a beginner on my Amiga and I have a problem.

I managed to make animations, using Lights, Camera, Action to assemble my pictures and animations in one intro. But (I never liked buts) after each animation I get a framework of lines around my picture.

Looks like a curtain and it is unwanted, so I don't like it. Is this an incompatibility problem between Dpaint III animations and LCA? Or a NTSC-PAL problem? How can it be fixed?

Can you give me some idea what software to use, in order to get perfect intros: Is there a NTSC version of Dpaint III? What I need is a program that can manipulate pictures and animations, that gives nice fades and wipes, and possibly even music.

One last question I'm thinking about buying a genlock and Digiview Gold. Can you tell me about how much this would cost, which would be most useful for intros and exactly what I can do with it.

Luc Depraeterc,
8690 Moorcslede, Belgium.

Lights, Camera, Action was a good when it first appeared, however it has been superseded and to be honest I don't know much about it.

Deluxe Video III is the newest and snaziest of the video packages. It does all you want, including sound. Your local dealer should be able to get you a copy. If you have problems call Electronic Arts on 0753 49442.

It costs £80, if you are on a tighter budget Fantavision is great value for money at £40. In the UK this is sold by Domark who are on 01-780 2222.

Questions, questions

Why isn't there a PD section in your mag? How come you never print any of my letters? Why do companies like Datel advertise hardware like the "SP11 scanner/Printer/Photocopier" when they don't even sell it any more.

Please explain how a thermal printer works, as I've phoned up everywhere and no one can tell me the technical side of things.

Why don't you have a software house section every month, say write about how they started and what are their latest games out, including interviews. Thanks for reading this letter.

Neil Mansell,
Canvey Island, Essex.

'Cos most Amiga PD columns are mega-boring. When we found someone who could write knowledgeably and interestingly about Amiga PD he wrote a few articles and then fled the country.

Who said I never print your letters Neil? OK so I cut them into little pieces first. Datel think we are such nice people (and they are right) that they love spending money on advertising in Amiga Computing, *and have to find something to fill the page with.*

Thermal printers use special paper or ribbons and burn the image on using an electric current. When the current goes through the paper it goes black. When it goes through the ribbon the wax ink melts and sticks to the paper.

Yes, a house call might make a good regular feature. I'll speak to TPTB.

It's a hamster

MIXING hobbies is fun and I want to connect my Amiga with an HF (shortwave) radio receiver and a suitable RTTY to Ascii converter to receive radio teletype press broadcasts.

A couple of problems have cropped up. Broadcasts run at 50 or 75 baud - Workbench only goes down to 110 baud. Would a buffer be required to receive this?

It's not just press broadcasts that are available, there's meteorology and merchant broadcasts to mention a couple. Would it be possible to run a story on the subject? I think it would make interesting reading.

I would like to know if anyone has tried using GLOBE on October's free disc using 180° for the latitude. For some reason the globe is drawn upside-down, must be for the Australian users!

VC Langley,
C5 Division, HQ Iberlant, BFPO.

No worries. A chap called Geoff Browne from Devon is working on a suitable program called RATTY, it uses the parallel port and a sound sampler with special software. The program isn't ready yet but when it is you can be sure that Amiga Computing *will be the first to let you know.*

Fun boy four

RUNNING to the rescue of Cpl Eldson, in your November issue, who wanted to play Gauntlet II together with as many people as possible. I send this description of an interface that lets him do so.

I strongly advise a tripple check of pin numbering and solder points before connecting his homework to the Amiga. Ignoring this point may have some permanent ill effects.

Christer Bau Jarla Herrgard,
Nacka, Sweden.

Joysticks	Parallel-port	Joystick 4	Parallel-port
Pin 1	Pin 6	Pin 1	Pin 2
n 2	Pin 7	Pin 2	Pin 3
Pin 3	Pin 8	Pin 3	Pin 4
Pin 4	Pin 9	Pin 6	Pin 5
Pin 6	Pin 13	Pin 7	Pin 12
Pin 7	Pin 14 (+5v)	Pin 8	Pin 14 (+5v)
Pin 8	Pin 25 (GND)	Pin 9	Pin 25 (GND)

Point of view

WHY oh why print a letter announcing another groovy new crew man? They are going to churn out largely illegal, and definitely boring, demos. I wouldn't recommend diving in and out of hardware the way Jolyon does it. He uses bits of assumed 680x0 protocol, and bits of -GfxBase that aren't necessarily guaranteed to work in exactly the same way all the time (we have two copper pointers).

Matt Adams,
Radlett, Herts

An expert writes

JOLYON'S article about the blitter in the Jan 1990 issue was quite good. I'm glad to see British computer magazines covering such techie topics. I do have a few quibbles which I'd like to take up with you however.

The BTST instruction only works with byte quantities when used with memory addresses, but you assume that it is words, and only get away with it due to a bug in Devpac that doesn't notice your BTST #14,$dff002 error. (Blit Check). Naturally, ArgAsm would have told you of this error.

If you were BTSTing any bits lower than 8 you would not have been saved by Devpac's bug.

I admire your brave examples of going low level to the hardware chips, but please please please use Labels! In particular the ones Commodore supply such as BLTCON0 or BLTSIZE. You mention them in your article but you don't use them in your programs very much. Please set a good example!

Some Amiga hardware registers are read-only and some are write-only registers. You must take note of this fact, and not read write-only registers. This messes up the bus, and potentially could cause annoyance to other hardware that was attached. It doesn't do the bus any good having a write only register read, as garbage gets on there for a few cycles.

At least two cases in your program use the CLR instruction to zero registers. This is a thing to avoid, since CLR does a Read-Modify- Write cycle, and as such is taboo (like the TAS instruction).

OK, it is the fault of the processor, but to Clear registers you must write explicit zeroes there. To save time you can MOVEQ #0,D0 then do a few MOVE.L D0s in a row. See

➤

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the Amiga Hardware Reference Manual for more details.

Keep up the good work of teaching how to do low level programming on the Amiga, but please keep hardware legal, at least.

Jeremy San,
Argonaut Software, Mill Hill, London.

Jolyon replies: Thanks for your comments Jez. I apologise for using BTST #14 I only found out that it was an illegal instruction when I was reviewing your assembler, and it didn't work! Must remember in future that just because something works it doesn't mean it should.

As for the bit about the CLR.W of hardware registers, you are right again. I saw this documented for the first time in the new hardware reference manual, which I got after writing the article.

As for label names, I can always remember $dff102, $dff180 but can never remember what they stand for. Just because I don't like using them myself I suppose I should in future use all the proper labels. I tried to do it all like that with the source for my ZOWEE demo, but I must of slipped out of good habbits back to my old ones.

The listener

PRO-SOUND Designer Gold won't play ball with sound as IFF instruments. To work properly with Aegis Sonix (v.2). I save the sounds as five octave instruments, adding the extension .instr, but when loaded into Sonix there seems to be an element of hit and miss as to whether instruments play throughout the whole range. Upper keys often only play the lower octaves. Lower keys produce no sound at all.

Once in a while the instrument will load with all octaves in their proper place. The problem occurs with my own samples sounds or with the instrument on the Pro-sound disc.

Kevin McCullen,
Camberly, Surrey.

Since my musical talents stop short of a Rolf Harris stylophone I asked around. Jim Hakwins, who wrote the Opus music program, came up with this answer through Cix, the online service: Sonix assigns octaves to the instruments so you will need to tweak them in the synth section. I assume you are saving them and reloading them after Sonix has created the .ss file?

Hack attack

OUCH! I have just read the article No Harm Done in the December issue. I decided to write to you to set some things straight. I am in a new group called Digital Holography. We consist of a coder, musician and graphic artist (me). Although we probably won't do any actual cracking, you could class us as a hacking group.

You said demos were the modern irritation of computing, and that most were nothing more than a pretty picture, repetitive music and daft scrolling text.

This made me really annoyed. If they are so bad, then why is it that you have had them on the coverdisc for the last 3 months? Isn't this a little hypocritical?

You said that "crackers think you'll be impressed by 64,000 bobs on the screen. I'm not." Well some of us are! If you think that flashy coding is sensationalistic, then you should have a look at your front cover this month "17 sensational programs - no one gives you more".

You had great fun taking the mickey out of hackers' names. Real names would be boring and wouldn't stay in people's minds. It is the same reason software houses have strange names (Bitmap Brothers, Electronic Arts etc). Nobody is going to buy a game by Joe Bloggs Software Writing Company.

You claim demo writers do not cater for people who do not have a meg or extra drive. At least we do not sell demos. Look at game manufacturers, who do not cater for people with PAL systems, but sell the games. This is much more serious.

I think the article was right – crackers help the industry, by making more people buy hardware. It's also nice to see the soundtracker getting recognition. It knocks the socks off the commercial software.

What the article really missed was the fact that we only make demos for our own enjoyment. If people don't like them, then they don't have to copy them.

I'd like to be involved in writing games, but it's difficult to get into the industry, so I do the next best thing.

I am giving my real name because I have nothing to hide. People who write to magazines giving only pseudonyms only lower the image of hacking groups.

Mark Otway (alias Stylo),
Chepperton, Middlesex.

The right stuff

CAN I make an appeal through your letters page to anyone writing software for the Amiga please?

C'mon guyz, give a little thought to compatibility before you rush your product on to the market. Just because it runs on your 512k A500 doesn't mean it'll run on my 3Mb B2000, or a machine with ECS, or for someone running morerows, or with a 68020 installed, or in the US where they have NTSC-sized screens.

Us Brits are getting a big slagging off on the various US networks because some of our major products don't work on their machines.

Is it really excusable that the

You named that tune

IN the January issue Jeff asked you to name the song that the MusicBox program on the cover disc played. It sounded a bit like a Peter Gabriel tune here and a bit like a Dire Straits track there, and none of us in the office could quite place it.

A number of you rose to the challenge. Leon Stringer, Sandy Munro and Christopher Peel all wrote to say that it was from the Pan demo by the TSK Crew. This is certainly true, but where did it originate before that? Dummys! Clifford Williams and Adam Liddell reckon it came from the SoundFX music package. Which is really intelligent of them because MusicBox is a utility for playing SoundFX tunes. Sheesh!

Another very stupid person, who lives in Upminster, said it was from Sledgehammer by Peter Gabriel. Wonder what gave him or her that idea? I say him or her because he or she didn't sign his or her letter.

Kevin Twyman of Cantebury thought he'd hedge his bets and have two guesses – the beginning of Funeral for a Friend by Elton John and the end of Ride Across the River by Dire Straits. Wrong and wrong.

Andrew Gibbs of Basingstoke freaked us out by saying that it was Truth Open Our Eyes by Marshall Jefferson from the Hip House album. Nice try, Andrew. Are there any more like you in Basingstoke?

The weirdest reply was from Mike Atter in Boston who tells us that his wife thinks it's Jesu Joy of Man's Desire. We had great difficulty in checking this one out, so it may very well be true for all we know.

Now, if you remember rightly, the rule of the competition was that you had to convince Jeff that you knew what you were talking about. Daniel Mata from Farnborough in Hampshire attempted just that:

Dear Mr Walker, I have been instructed by Mr Mark Knopfler to initiate legal proceedings against you as a result of the breach of copyright regulations made on your January cover disc. Please refer to Mr Knopfler's classic Brothers in Arms and listen to the introduction to Ride Across the River carefully.

In order to convince you that this is not a flippant accusation by Mr Knopfler, please turn up the volume bloody loud and imagine it a couple of octaves higher.

As Mr Knopfler's legal representative I have been authorised to say that formal proceedings will be made against you should adequate recompense not be forthcoming. Mr Knopfler has indicated that the two MusicBox discs will do nicely. Otherwise we'll see you in court, matey-boy.

Yours, etc.

Nice one, Daniel. We think you're wrong, but we're sending you the MusicBox discs anyway for sending the wittiest letter and not because the editor thinks you're telling the truth about being Mr Knopfler's legal representative. (You aren't, are you?)

The correct answer, we think, is that the music was by Tangerine Dream and stolen from the soundtrack to the fantasy film Legend. Didn't any of you watch it? It was on over Christmas.

The only person to spot it was Peter Sapwell from Castleford who is sorry to say that he has no bribes or bootlegs. And I'm sorry to say that I've already given the MusicBox discs to Daniel Mata. Hard cheese, Peter, but that, as they say, is life.

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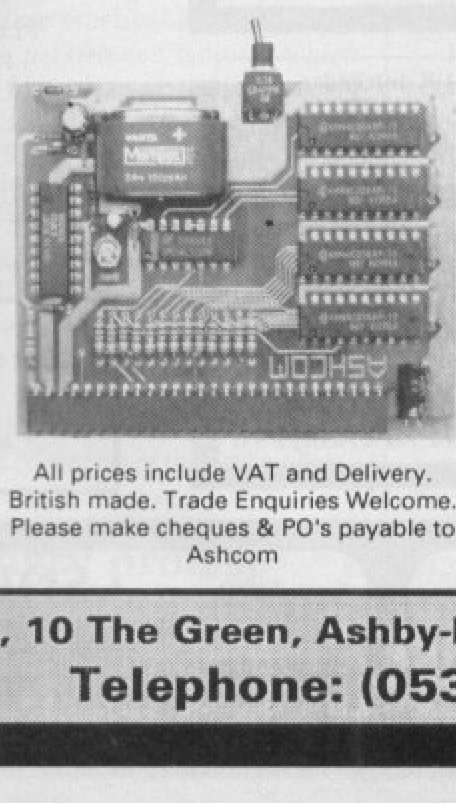
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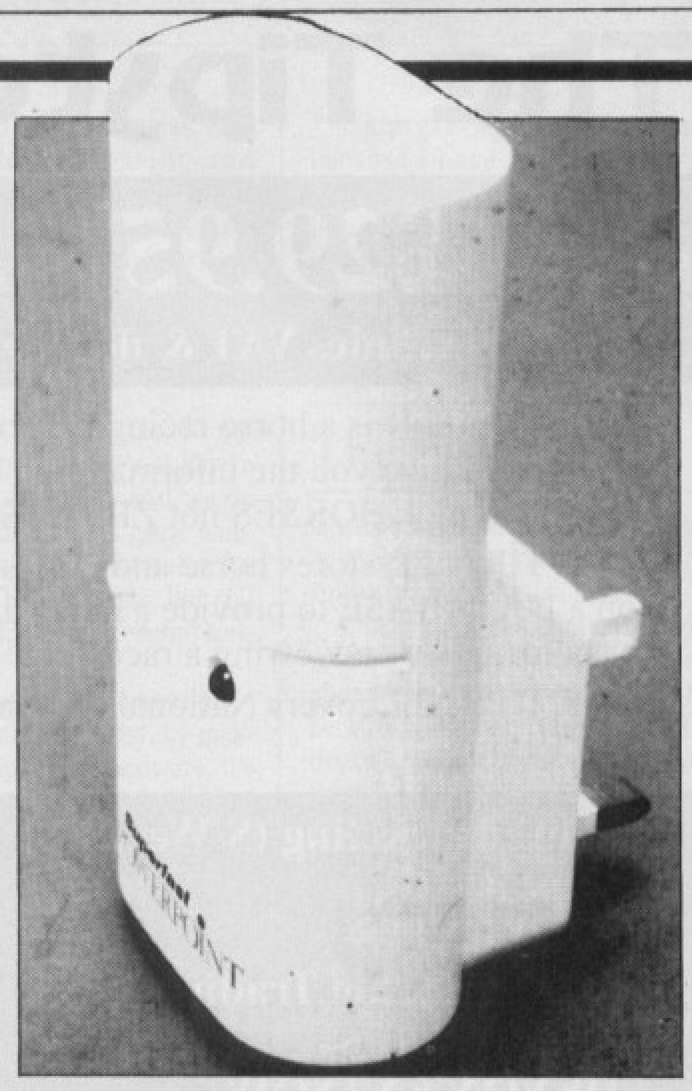
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copy protection on Populous breaks on a machine with a 68020 installed? Commodore has set up a lab at Maidenhead with all sorts of different configuration machines available and which any of you can use, so c'mon guyz, let's start to give UK software some cred eh? "

Paul Ockenden,
Brighton, Sussex.

I've been framed

One day, because I was feeling rich, I went out and upgraded my old A1000 to an Amiga 2000 with the hard disc controller that your magazine called "the best on the market". The Microbiotics Hardframe. It doesn't work. My Amiga is the latest one, revision 6.0 with the new Agnus chip, and yet when I switch on the hard disc won't auto-boot.

Chris Moss,
Bramhall, Stockport

Erm, you don't have the latest A2000. Commodore discovered a problem with the bus timing on 6.0 machines and went to 6.1 and then 6.2 to solve this. It is not the fault of Microbiotics, contact Commodore at Maidenhead on 0628 770088 who will sort out the incompatibility for you.

While no UK policy has yet been sorted out indications from the US show that Commodore have been incredibly helpful towards owners with this problem.

Getting so much bigger

MEMORY expansion confuses me. I own a one meg A500 and would like to upgrade but don't know which is the best buy. George Thompson aka Mast offer an external cartridge up to 2 megs. Second, several companies offers cards up to 1.8 meg. Third, others offer boards up to 8 megs.

As memory expansion is an expensive business, could you answer the following questions: What is the difference between a card and a board, and where do they fit?

Ideally I would like another 2 meg, but I doubt if I can afford it in one go. Bearing this in mind, which type would you suggest?

At the moment, I don't see a need for a hard drive and I doubt if I ever will. But supposing I change my mind, could I take the memory chips and put them in the A590?

What does Auto-configure mean?

I have an external drive fitted which uses power from the computer. Presumably the memory expansion will also draw power from the computer. How much extra memory can I have without causing too much strain on the power pack?

I had considered another external drive (a pure luxury item I, admit), would the power pack cope with both drives and 2.5 meg extra? The main reasons for this extra ram is to use with Dpaint III and to create a RAD: to copy my Workbench disc to. Any advice on the best type to use? I hope you can help me, as I said before, memory costs money and I want to make sure I spend my hard earned dosh wisely.

Jon Campey,
Brentford, Middlesex.

Expansions come in three flavours. External, internal and A2000. The terms card and board are used interchangeably. An internal unit replaces the A501 you already have in the trapdoor under the computer.

This is the neatest solution, but means you can't use the half meg expansion. An expensive solution. A2000 expansions use the slots in the big Amiga. These can only be used with an A500 if you buy an expensive expansion box. There are technical problems with such expansions, so they are best avoided.

This leaves you with an external unit. It plugs on to the side of the Amiga and should pass the connector through so that you can add other peripherals. They are all much of a muchness, I'd recommend buying from a local dealer in case you have problems.

The MAST Minimegs (077-082 234) looks like a good bet. You can buy a small one and then send it back to be upgraded when you can afford more ram. Assuming it has a through connector, a hard drive can be added on; there is no need to take the chips out. The A590 uses expensive chips and it would not make sense to buy an expansion which took these just in case you wanted to upgrade.

Your power requirements depend on the types of drive and ram you are using. Commodore recommends that you only power a one meg machine and a single drive off the standard Amiga supply.

This is partly playing safe and partly because the Commodore external drive is very power-hungry.

It is usually safe to use two external drives if they have a low power rating. However two drives and lots of ram is pushing things a bit. If you want a third drive go for one with its own power supply.

When you add ram the computer needs to know what memory addresses to use. Two expansions in the same place would clash. This can either be done by running a special program or by having auto-configure circuitry on the expansion which looks to see which addresses are already used and chooses a free space for itself.

Steady telly

Forget games. My fave prog is DPaint, I'd like to use the 640 by 400 mode but can't stand the interlace shimmer. I've heard of a Flicker Fixer and want to know where I can get one and what it will cost.

Peter White,
Ludlow, Shropshire.

Unless you have an Amiga 2000, forget the Flicker Fixer – it needs the video slot on the right of the big machine. This is a wonderful device which double-buffers screens and then displays them on a VGA type monitor. This means you need a very strong bank account.

The Flicker fixer costs £399 and a suitable monitor at least £300. If I haven't put you off contact Microway, designers of the device on 01-541 5466. Flicker is actually the wrong word, proper TV engineers use the term to mean a large area of colour, erm, flickering. The term they use for what we suffer with an interlace picture is "twittering". There now you can use the real term and no one will understand you.

More practical solutions are a long persistence monitor which will blur whenever anything moves quickly on the screen, or to wait for the Enhanced Chip Set.

While the first of the two chips you'll need is already available, no dates for the availablity of the second of the new chips have been announced. My guess is April.

It will need a multisync monitor, and some software (including DPaint) will have to be modified to take advantage of the new modes.

Angry protest

HELLO, I am a co-sysop of one of the "infantile" bulletin board services which one of your writers indirectly categorised in the supplement last month. I disagree with what you said.

Most bulletin boards are run totally FREE. You don't pay for anything, time on the board, entering messages, or for downloading files.

Most boards are run by amateurs for amateurs. We don't make any kind of living from it. OK?

If people don't like a bulletin board after using it once then they won't come back to it. This is what determines the success of a bulletin board, and NOT by some overpaid, slobbering hacker writing articles. If a bulletin board, is no good it won't survive.

Computer hardware does not come cheap, but someone has to pay for a modem, a hard disc and the software running a BBS. None of my favourite bulletin boards have tried to force users to pay for their facilities.

If a donation is made (and people don't send money to boards which have no potential) then it will be gratefully received. As far as I am concerned, there is no need to pay for the use of any bulletin board.

Those which charge a subscription are simply trying to exploit the many inexperienced users of computer communications which arrive on the scene.

The only other exception is when the sysop has to pay for a facility such as international net mail where the sysop is charged for making use of a central international mailing point.

I hope the above has set you thinking a little about using bulletin boards, the ideal phrase being "you shouldn't look a gift horse in the mouth". Just because a BBS is free, that does not mean is isn't good. The users, and only the users, have the right to criticise a BBS and not some hopeless idiot who have no clue about the real world.

Eric Cox,
co-sysop, The Equaliser BBS

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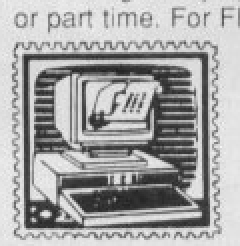
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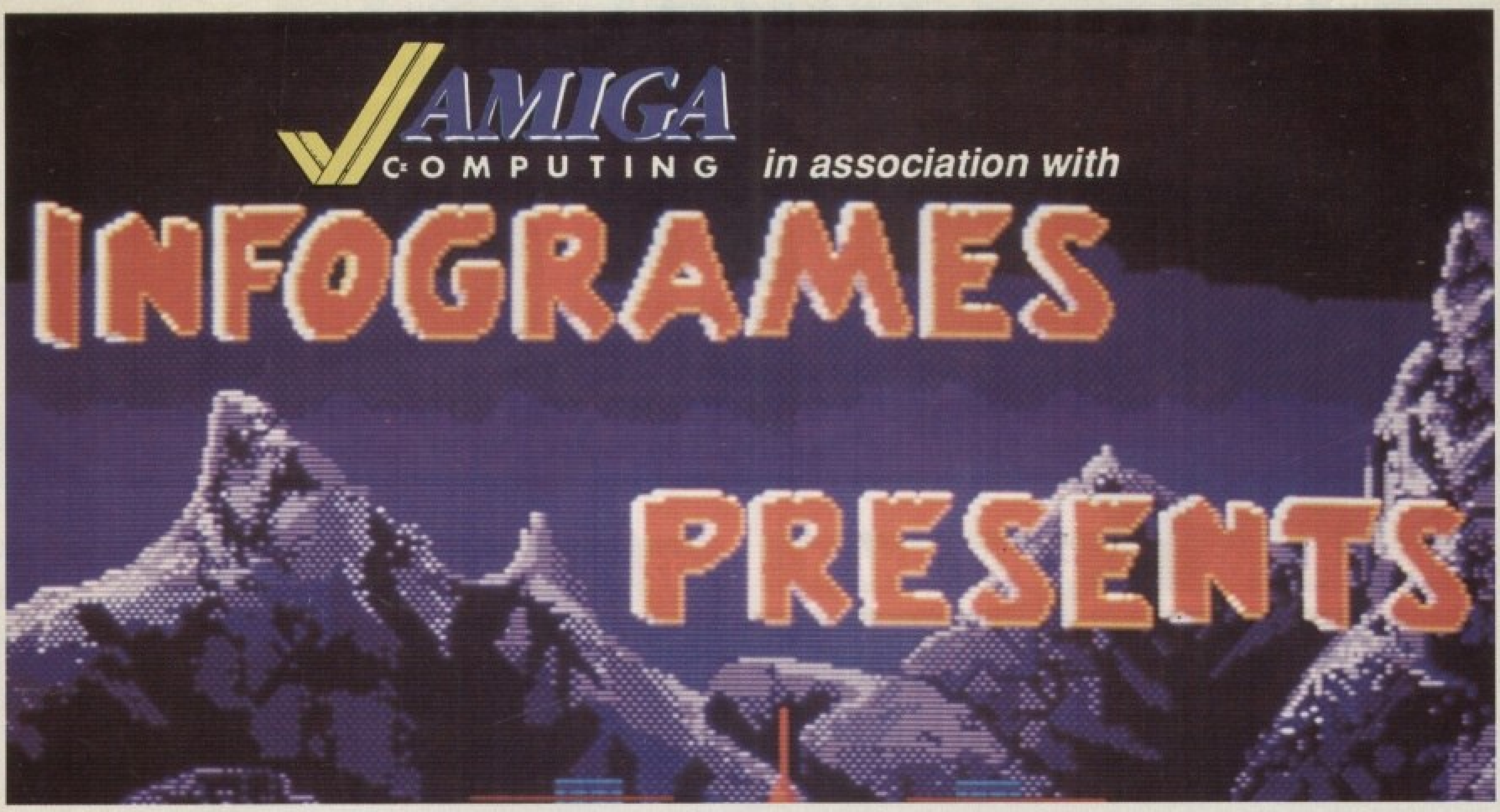
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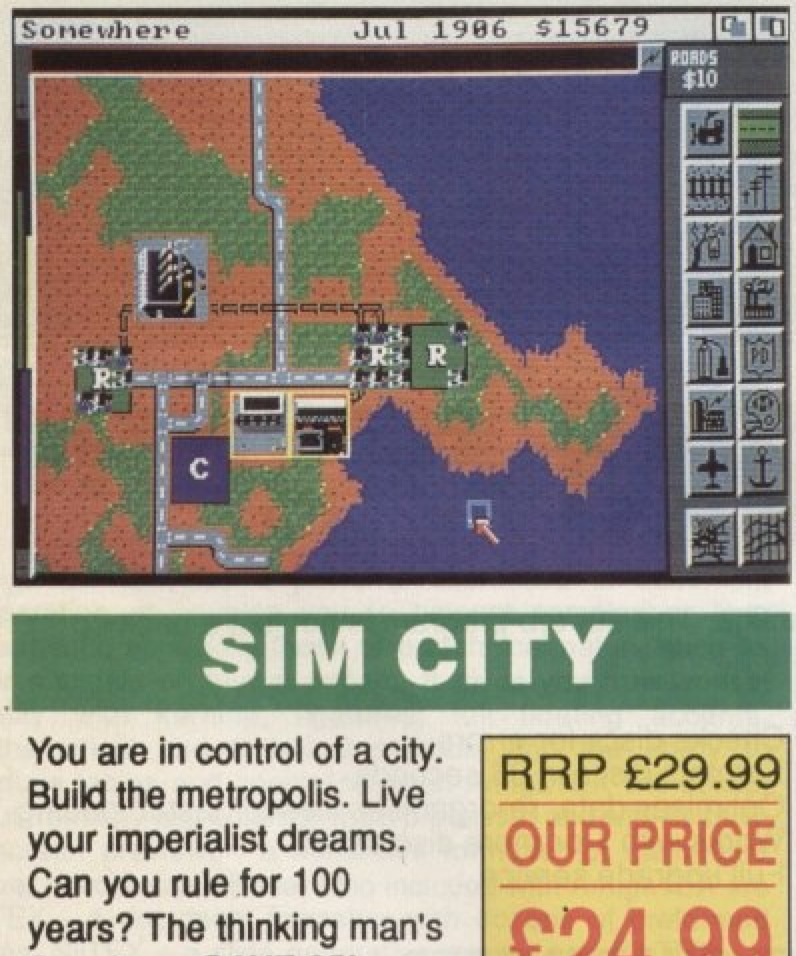
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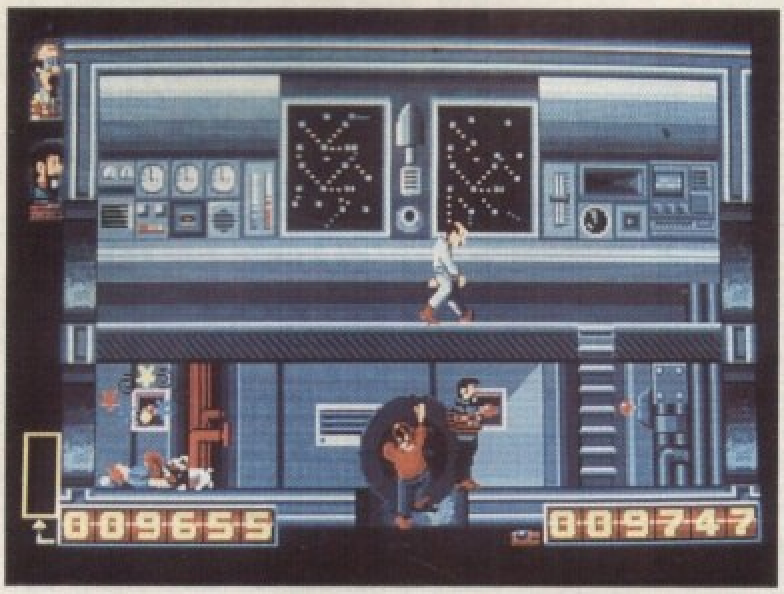
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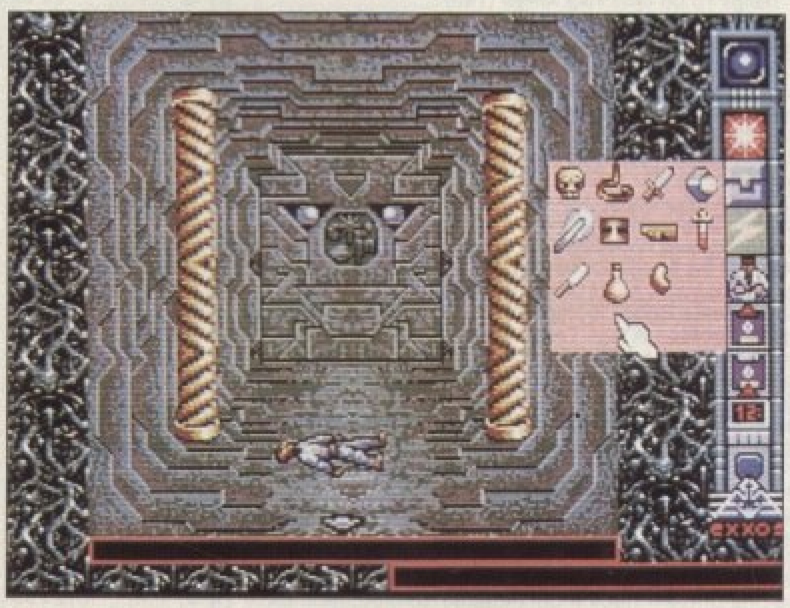


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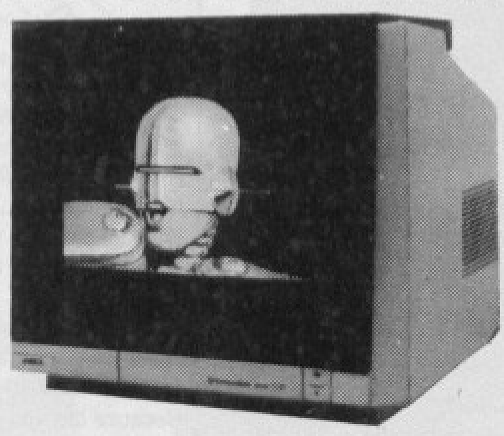
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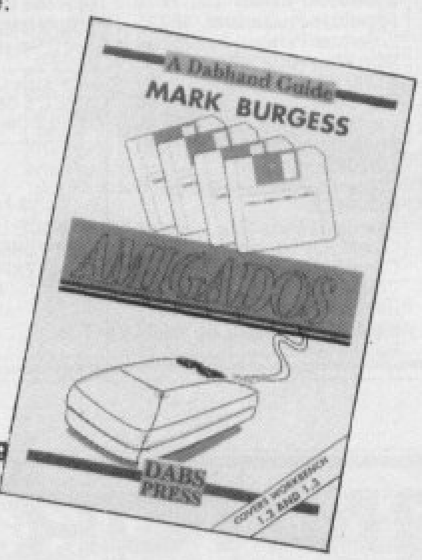
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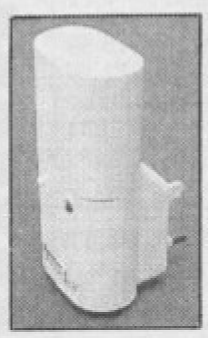
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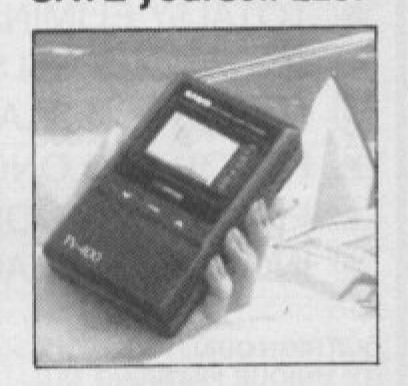
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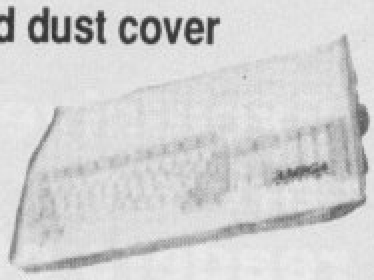
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So what is all this fuss about Unix?

SOME Amigaphiles are getting very, very exited about Unix. To understand why means you have to know what it is and why the Amiga is special.

Unix is a very old operating system, one designed for minicomputers. But as micros have become more powerful they have proved themselves capable of running such software. You may think AmigaDos is big, filling a whole Workbench disc along with more code in the rom and other bits on the Extras disc. Unix is huge. It fills an 80 meg hard disc.

But why would anyone want to junk AmigaDos in favour of Unix? Well plenty of us wouldn't. However as computers get more complicated and users demand more from them, software needs to improve.

Some people – many of them within IBM – see Unix as the logical next step.

Even the standards are pretty well sorted out. The idea is that a Unix program written for any machine will run on any other Unix machine.

This should be very simple, easier than an ST-to-Amiga port. And with the next revision of Unix. Known as System V.4 (pronounced five- point-four), everything will be as simple as that. This is where the Amiga comes in.

Commodore is in the forefront of V.4 development. Only three companies have shown machines running V.4, all at a Unix exhibition in New York last November. One of them was Commodore. The other two, AT&T and Sun, are long established as Unix uses. AT&T owns the copyright.

While programs may be compatible, it would be much more useful if they looked the same on all machines. To this end a standard windowing system, much like Workbench, is used. Called X-Windows it means the programmer doesn't need to try every Unix machine to be sure that the results will be the same, and yet the program can take advantage of any special features a machine has. Like a blitter.

It is this which makes the Amiga a super way to provide Unix.

A standard Amiga can't do it, although there is a version of X-Windows which works with AmigaDos. Unix needs at least a 68020, and preferably a 68030. The go faster chips work with a memory management unit to look after multi-tasking.

When one Amigados program crashes, all the other programs usually go with it. An MMU stops this. The program which crashes shuts down and the rest of the computer is free to carry on.

The machines destined to run Unix are not current Amigas, although A2000s can be upgraded. Amiga Unix will be supplied for the A3000 and A3500 being launched in Germany soon. Using a Motorola 68030 at 16 or 25MHz depending on the model it will have a big and fast hard disc, be capable of taking a lot more ram than the 9 meg the current range is limited to, and mark the entry of Commodore into the world of top-flight computing.

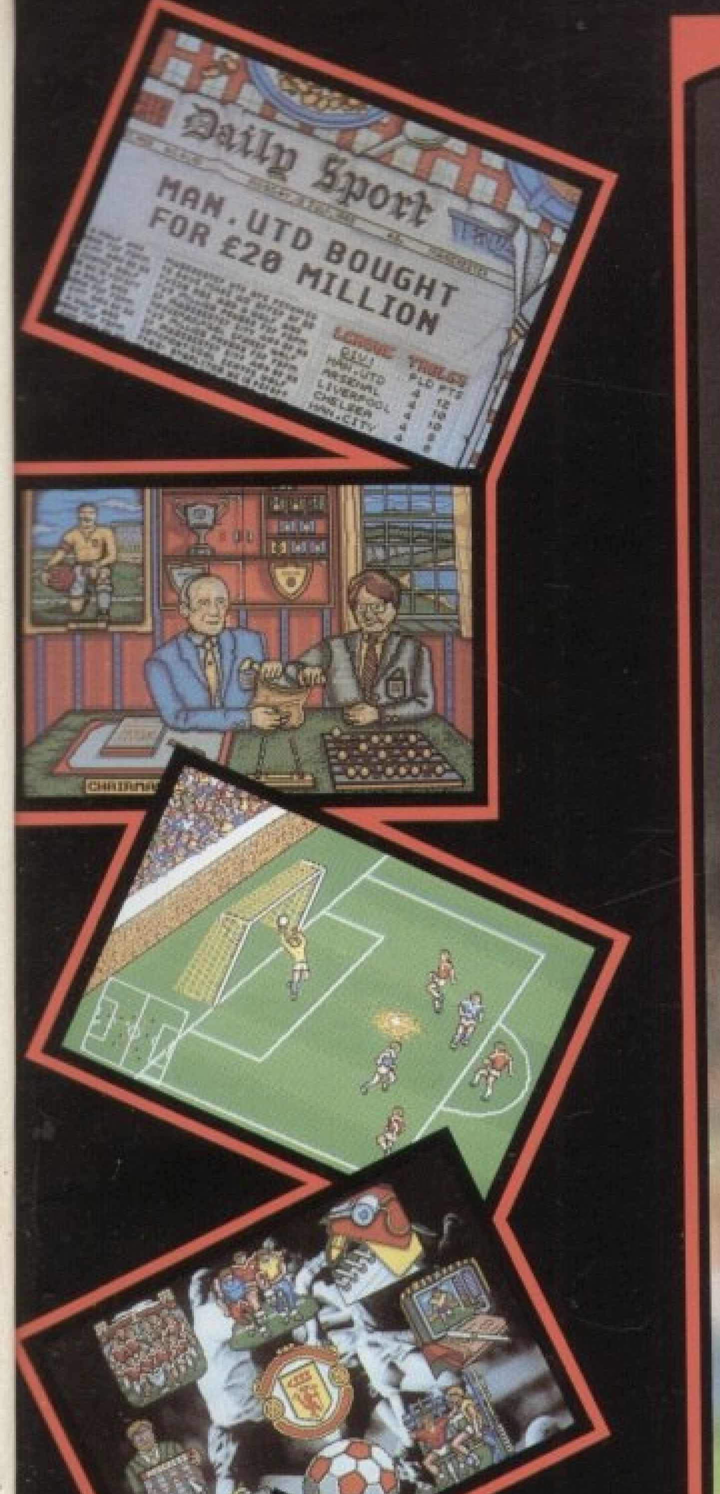
So Unix is important to Commodore because it will allow it to sell a lot of very expensive machines into a new market. It is not very important to the traditional customer who has upgraded from a C64 to an Amiga 500. At least not yet.

Once upon a time 4,096 colours and even a mouse were things you only saw on the very best of workstations. Now they are common. We will see Unix, and faster more powerful Amigas in the home but not for a while.

Today's companies with deep pockets will finance our home computers of the mid 90s – and the Amiga will be there leading the way.

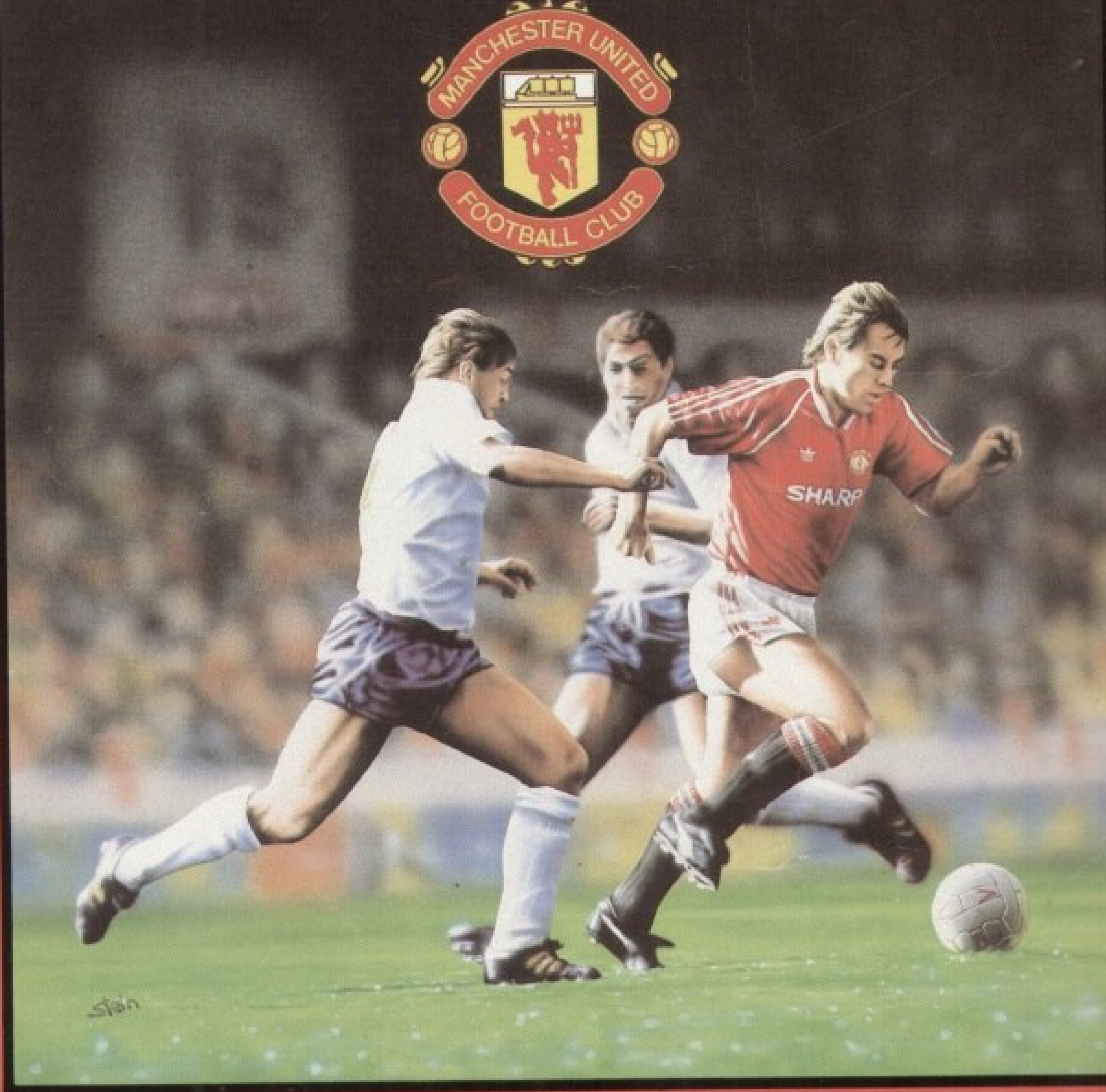

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Your mission : land your spaceship, get a maximum load of



In a previous campaign, this attack boat got stranded on a reef ; now is it abandoned : "The ore goes first !".

ore, disintegrate or get hold of the precious equipment of the rival companies and, if possible, capture their own



The ultimate flood. Though a turret is destroyed, this space-ship of the TATOU Consortium manages to lift off.

spaceship bursting with ore. Under your command a whole steel armada : barges, attack boats, tanks (amongst them the famous T99 known as the "Big Heap"), transporter crabs and the unique "Weather Hen". This extraordinary machine, the technological pride and joy of Ludodelirium Motors & Co., is able to transform the ore into material. Not

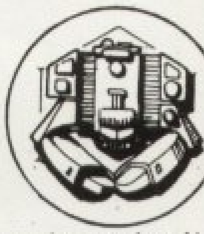


Isolated by the high tide, with its defenders neutralized, the "Delirium galaxy" may be your next victim.

only that, it also foresses the changing tides. On Full Metal Planete ignoring the rising tide means foolhardiness. How easily your attack boats could

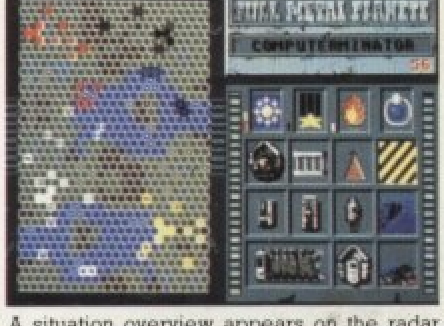


get stuck or your tanks flooded in the next turn !



Free game piece enclosed !

It is imperative that you lift off before the Big Flood, announced for the 25th turn... Ground contact in 50 seconds. Welcome on Full Metal Planete ! Action, fights, stategy and diplomacy in a fantastic Sci-Fi world where up to 4 players (humans and robots) affront each other in a thrilling competition.
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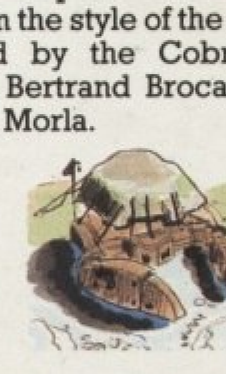


A situation overview appears on the radar screen. Beware of threatening "Black Star" ! What about an alliance ?



The FULL METAL PLANETE'S pack mule is the barge which can transport ore and vehicles.

offers you adversaries who are always available : 6 robot-players each having their own character, but they are all programmed for a sole aim : beating you !
Furthermore this game contains a graphic tool to create your company's blazon and strategical problems for you to solve in order to get trained. A superb adaptation of the board game in the style of the games created by the Cobra Soft team : Bertrand Brocard and Roland Morla.



Stuck in the mud ! This venturesome crab has been surprised by the flood and can only hope for the next low tide.

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